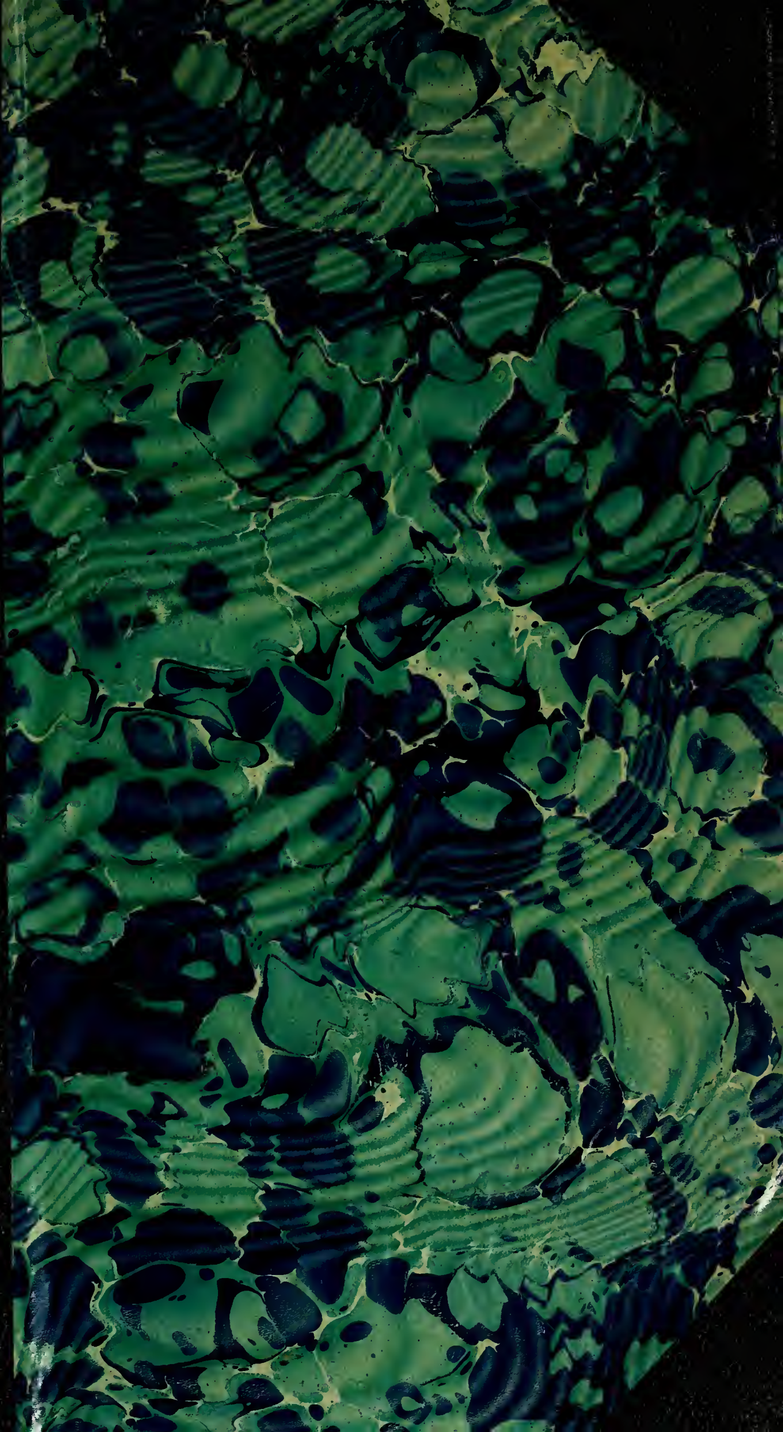

FIRST

ANNUAL REPORT

OF THE

BOARD OF PUBLIC WORKS

TO THE

COMMON COUNCIL

OF THE

CITY OF CHICAGO.

JANUARY 1st, 1862.

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S P. ROUNDS, PRINTER, 46 STATE STREET.
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BOARD OF PUBLIC WORKS.

COMMISSIONERS.

BENJAMIN CARPENTER, *President.*
FREDERICK LETZ, *Treasurer.*
JOHN G. GINDELE.

OFFICERS.

E. S. CHESBROUGH, *Chief Engineer.*
A. W. TINKHAM, *Secretary.*

COMMISSIONERS' REPORT.

OFFICE OF THE BOARD OF PUBLIC WORKS,
CHICAGO, Feb. 24th, 1862.

To the Mayor and Aldermen of the City of Chicago, in Common Council assembled:

GENTLEMEN: In conformity with the requirements of the new charter organizing this department of the municipal government, we transmit herewith the annual report of the Board of Public Works.

The Board was organized May 6th, 1861. Suitable rooms had previously been provided in the Court House, and as soon as was practicable the rented offices occupied by the late Boards of Water and Sewerage Commissioners were vacated. All the city departments are thus gathered into one building, and it is a matter of considerable convenience to the citizens that the payment of the water tax and business with the water and sewerage departments, as with other departments under the care of the Board, can be attended to where the general city tax is paid, and where are the various offices of the city government.

By the terms of the act of organization, this Board is charged with the care of the Water Works, the Sewerage Works, the Public Parks and other public places of the city, the Streets, the River and Harbor, the Public Buildings, the Bridges, the Lamps and Lights for the lighting of the public places and buildings of the city, and with the direction of all the public improvements hereafter to be commenced by the city.

There have thus been transferred to this Board the duties of the Water Commissioners, the Sewerage Commissioners, the Street Commissioners, the City Superintendent, and of the Special Commissioners for the making of assessments.

The consolidation of the Water, Sewerage and Street departments, besides reducing the expenses of the city some eight thousand dollars in rents and salaries, has done away with the previous liability of collision of the three departments in carrying on their separate branches of duty. Under the present management by one responsible body, it is found in most instances where costly and permanent improvements are being made, that proper sewerage, gas, and water connexions can be made at one and the same time.

It is believed also that that provision of the charter which places all the improvements of the city under the care of one Board, and which requires the action of the Board upon all matters of special assessment, will be found to work for the public interest. All improvements to be paid for by general or special tax are thus subjected to an extended examination by the Board and by the Council, and of necessity all the steps preparatory to and during the progress of a city improvement, are systematized and made matters of record.

The report is arranged under appropriate heads corresponding with our books of accounts, which comprehend and specify the expenditures by the Board during the year.

As the last annual report of the Water and Sewerage Boards represented the state of the Water and Sewerage Works on the first day of January, 1861, the present report is intended, as far as is practicable, to exhibit the water and sewerage affairs for the whole of the year 1861. The report of operations in other departments under the care of the Board will go no farther back than the date of the organization of the Board—May 6th last.

WATER WORKS.

DISTRIBUTING PIPES.

Within the past year 13,761 feet of distribution pipes have been laid in the three Divisions of the city, at a cost of $12,008,11.

NEW MAIN.

The large main extending from the pumping works to the South Reservoir, (crossing the river below Rush street bridge), has been laid down and completed in accordance with the plan set forth in the last annual statement of the Board of Water Commissioners. The expectations of the Board in regard to this main are fully answered now that it is in use. The supply to the South and West Divisions is much improved. The supply of water is abundant, not only for ordinary uses, but for the extinguishing of fires if needed, and the danger of loss by fire is thus materially lessened. Apparently this increased supply is pumped with less cost than was the smaller amount formerly furnished. This agrees with the anticipations of the Board, and is due to the fact that the resistance to the flow of the water is much less with the larger than with the smaller main. The entire cost of this main was $49,032,53.

IMPURE STATE OF THE WATER.

The recent complaints of our citizens in relation to the impurity of the water at this time, have arisen from causes wholly beyond our control. The small fish of which complaint has been made are indeed a source of annoyance, but they can be guarded against by a small expenditure, arrangements for which will be completed in the Spring. But the prime cause of every serious complaint arises, in our opinion, (based upon careful examination), from the large quantities of blood and other waste and foul substances that find their way into the river from the many slaughtering and rendering establishments, distilleries and other works of a like nature, which, as all are aware, have increased to such an extent within a few years, as to render it necessary that proper steps be taken to prevent the yearly recurrence of the same difficulty.

The extension of the inlet pipe a mile further out into the lake would probably protect our citizens against the *frequent* repetition of this great nuisance; yet we are not confident that the remedy would be *complete*, for the reason that at certain periods the muddy and impure water of the river extends even beyond that distance from the lake-shore—although the impurity never could be as great as we now occasionally find it in the vicinity of our present inlet pipe. The cost of such extension would probably be from one hundred thousand to one hundred and twenty-five thousand dollars.

Admitting that this expenditure would improve the water for the *time being*, and also in the future, and that the present trouble arising from the causes stated above is thus remedied, the great evil *still remains*—to exhale its noxious vapors, and to endanger the health of our citizens. We cannot believe that it will long be suffered to exist, even if the inlet pipe shall be extended as suggested, and *when this* *nuisance shall be removed, there will be no longer a necessity for extending an inlet pipe thus far.*

There still remains sufficient doubts as to the *feasibility* of extending an iron pipe five feet in diameter so far out into the lake, to demand the most careful consideration before engaging in an enterprise requiring so large an outlay of money. The Board have no examples before them that afford proof of success, and it is believed that the *experiment* would be entirely novel—of laying a pipe of the required size so great a distance, where it must encounter the strength and violence of so large and boisterous a body of water as Lake Michigan. The doubts and difficulties that suggest themselves as we examine the subject may well induce caution and a thorough calculation of the obstacles to be encountered.

The last report of the Board of Water Commissioners very fully discussed the various projects proposed for obtaining water "free both from the wash of the lake shore and the flow of the river"—and a reference to their report at this time can be made with interest and profit. It will be found that some five different methods were more or less considered, one being the extension of the inlet pipe a mile out into the lake, already referred to. These different projects are given below.

1. The extension of the inlet pipe a mile out into the lake.

The estimates of the cost of this extension vary from about $66,000 to $125,000. The iron pipe alone would however cost nearly or quite the first sum, without the placing of the same on the lake bottom. The estimates are not presented as safe computations of the cost.

2. A brick tunnel six feet in diameter, and extending a mile out into the lake. Estimate of cost, $126,000.

3. Removal of the pumping works to Winetka, a distance of 16 miles north, where the shore rises 80 feet above the lake. The estimate of the cost of the pipes conducting the water from these new works to the city was $1,689,600—nearly double the cost of the present water works; and to this would have to be added the cost of the new pumping works, and the pipe extending into the lake, and the cost of a reservoir on the high grounds at Winetka.

4. Filter Beds, at an estimated cost of $107,500.

5. A subsiding reservoir, at an estimated cost of $107,775.

The city has still available the occasional pumping out of the river by the pumping works at Bridgeport, if as supposed, a suitable arrangement could be made with the Canal Company for doing the pumping. Such an use of these works for the purifying of the river was anticipated by the Sewerage Commissioners, as will be seen by reference to their reports, and particularly to that of July 1, 1860. It is probable that some four or five days pumping, at a cost of about $150 per day, would correct the present offensive state of the river. The remedy would of course be but temporary in its effects, but while in operation, we feel confident, would prevent the recurrence of the serious annoyance, to which we have been subject during the present winter. Although the daily expense, when deemed necessary to employ the pumps, would be as stated, some $150, it would enable the Board to avoid the increase of the city debt, to the extent required to extend the inlet pipe into the lake, and answer the double purpose of improving the water, and also of *purifying* the river—which latter is quite as important to the well being of our city, as the advantage to be derived from the former.

The Board are continually extending their investigations, and particularly for the purpose of ascertaining how far up and down the lake the effects of the discharge from the river can be traced. Besides the projects already referred to, it is proper to say that consideration has been given to one or two other plans, which at present are not sufficiently matured for the Board to express an opinion as to their merits. One of these is the making of a sort of filtering reservoir on the lake shore, a mile or two north of the city limits, from whence the water will be conducted to the present pumping works, to be elevated as is now done. Such a reservoir should be located within 150 to 200 feet of the lake shore, or so near that the water will filter through the intervening bank of sand and gravel so rapidly, that to hold several days' supply, the reservoir required will not be excessively large. It is proposed to conduct the water thence to the present works in a brick aqueduct, the water to be pumped from the reservoir to the aqueduct by a small steam engine. Such filtering reservoirs are in use in several places—one being in Hamilton, Canada West—although it is not known that there are any furnishing so large a quantity of water as is needed for the supply of this city. Observations made as to the quality of the water at the suggested location of the reservoir, failed to discover there any trace of the effects of the discharge from the river.

Should the Council recommend the *total* discontinuance of the establishments referred to, in accordance with the ordinances heretofore passed, the evil would in a great measure be removed, and the proposed large expenditure for the extension of the inlet pipe might be delayed until a sounder opinion could be formed as to the best plan for securing a constant supply of the pure water that we have within our reach, or it might then be found to be unnecessary.

But, on the contrary, if the Common Council determine that the removal of the offensive establishments already referred to is inexpedient or impracticable, and the employment of the pumping works at Bridgeport too uncertain and expensive, then the Board, with its present light, would recommend the extension of the inlet pipe as the most feasible plan, considering the cost that has been before them.

If the Common Council deem the suggested extension of the inlet pipe the most practicable of the several projects considered, and shall by ordinance authorize the Board of Public Works to issue sufficient water loan bonds for this purpose, the work will be commenced in the spring, provided that a contract can be made with responsible parties for the completion of the work at a price within the range of our estimated cost.

At various times during the past year specimens of water were collected at different places from the lake, and in some instances from the river, for the purpose of getting the light to this matter to be had from a chemical analysis. These various specimens were placed in the hands of Messrs. Blaney & Mariner, and were analyzed by them. The results of their examination are embodied in their report, which we here introduce. It will be found to furnish information of interest and value as to the qualities of the water in different localities, and in different conditions of the lake.

MESSRS. BLANEY & MARINER'S REPORT.

CHICAGO ASSAY OFFICE,
Feb. 8, 1862.

To the Board of Public Works of the City of Chicago:

GENTLEMN: In the accompanying tables we present the results of our analyzation of twenty-three samples of water, collected and placed in our hands by E. S. Chesbrough, Esq. They were contained in glass demijohns, sealed and numbered. The localities, from which they were obtained, were not given, and are unknown to us. The samples were received at different times, from the 18th of April to the 20th of November last.

Table A shows the substances detected in the waters, and gives, in grains, the quantities of each in one gallon.* It presents the direct results of the analyzation from which those given in table B are derived by calculation.

Table B shows the manner in which the substances, enumerated in table A, are combined together among themselves; the compounds thus formed; and the quantity, in grains, of each in one gallon. It may not be superfluous here to state, that most of the substances, mentioned in table A, do not exist in the waters themselves in the free, or separate, state in which they are there presented; on the contrary, they are combined with one another; the sulphuric acid, for instance, with a portion of the lime, forming sulphate of lime, and the rest of the lime with carbonic acid, forming carbonate of lime. In like manner are formed carbonate of magnesia, chloride of sodium, &c., in the quantities and in the proportions set forth in table B.

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*Throughout the Report and tables, the U. S. standard gallon, (or wine gallon), of 231 cubic inches, is referred to. It contains 58,318⅔ grains of water.

These results show the presence in the waters of four distinct classes of substances, namely:

I. SOLID MINERAL MATTER,
- Sulphate of lime.
- Carbonate of lime.
- Carbonate of magnesia.
- Chloride of sodium.
- Protoxide of iron, alumina [and phosphates.
- Silica.
- Soda.

II. SOLID ORGANIC MATTER,
- Animal.
- Vegetable.

III. GASEOUS MATTER,.........
- Sulphuretted hydrogen.
- Carbonic Acid Gas.
- Oxygen.
- Nitrogen.

IV. UNDISSOLVED OR SEDIMENTARY MATTER,
- Organic.
- Mineral.

Proceeding to treat of these classes in order, we have

First, Solid Mineral Substances.—These are the most abundant, and have a practical interest on account of their relation to animal and vegetable life, domestic economy, manufactures, the generation of steam, &c., &c. They are found, in greater or less quantity, in all natural waters. Rain water, however, if collected at a distance from habitations or the sea, does not contain them in any sensible quantity. Natural waters, arranged according to their general purity, will appear in the following order:

1. River water.
2. Lake, or Pond, water.
3. Spring water.
4. Mineral spring water.
5. Sea water.
6. Lake water from lakes having no outlet.

The purest known river water is that of the river Loka, in Sweden, which contains only 1-25 of a grain of solid matter in a gallon. Other rivers contain greater quantities, as the

Croton River, (N. Y.), 4.160.
Schuylkill, (Phila.), 4.261.

The rivers of France contain from 4 to 32 grains in a gallon, averaging 16; those of England, from 6½ to 19½, averaging 14½.

Lakes contain, generally, more dissolved matter than the rivers which flow into them, owing to the extensive surface and consequent evaporation and concentration of their waters. Lakes, however, though containing more solid matter than the average of the rivers running into them, may yet contain less than some one of them. This occurs when a river, rendered impure by local, or other, causes, is too small to modify the lake into which it flows.

These mineral constituents, when of the ordinary character, and not in excess, are not, by any means, to be regarded as impurities so far as the use of the water as a beverage is concerned. These earthy matters are, in fact, essential to the water as a beverage. Their total absence, as in distilled water, would render it unfit for such use. Some waters, in constant use for drinking purposes, contain as much as sixty grains to the gallon, and even more; but, generally, in the waters of average purity used for domestic purposes, there are not present more than from 17 to 25 grains of mineral matter to the gallon.

Table B shows that the mineral matter, in the waters examined, varies, in quantity, from 8 grains in No. 16 to 21¾ in No. 22. In its composition, the mineral matter is of the ordinary character, the only noticeable peculiarity being the unusually large proportion of silica which it contains.

Domestic Economy is also seriously affected by the quantity and quality of these mineral constituents. Culinary operations, for example, are in that way affected, sometimes injuriously, sometimes beneficially. On the whole, however, their presence, in this case, is decidedly objectionable, as their absence can be remedied by a proper addition to the water, while their presence, when injurious, cannot so easily be avoided. If we wish to soften meats or vegetables and obtain their juices or soluble principles, as in the boiling of peas and beans, and the preparation of tea, coffee, and soups, the best water for the purpose is that which is the softest or purest. Such waters have more solvent power than any other, and are therefore better adapted for such purposes. If, on the other hand, we wish merely to *cook* the substance without separating any of its constituents, the best water is that which is hard and contains dissolved mineral matter. To communicate this quality of hardness to soft water, salt is frequently added.

In relation to domestic economy, these mineral substances are considered the most objectionable in the *laundry*. Water is said to be hard or soft according as it does, or does not, produce decomposition or curdling with soap. This effect is due to the presence of lime and magnesia compounds in the water which unite with the fat in the soap, producing insoluble substances which separate from the water and cause the appearance called curdling. In this way a constant waste is occasioned, corresponding to the quantity and quality of the mineral matter in the water. Hence water that is palatable, and apparently quite wholesome, may yet contain so much mineral matter in solution, as to be unfit for laundry or culinary purposes.

Incrustation presents another difficulty, occasioned by the presence of mineral matter in the water. The carbonates of lime and magnesia are held in solution by the free carbonic acid gas contained in the water, and are precipitated when it is boiled and the gas driven off. Sulphate of lime, on the contrary, does not require the aid of carbonic acid gas for solution, but is precipitated in consequence of evaporation and its limited solubility in boiling water. The silica, alumina, and oxide of iron are also deposited during the escape of carbonic acid gas and the evaporation of the water. It is a well known property of these earthy deposits, that they attach themselves to the sides of the vessels in which the water is boiled, in the form of a solid, hard incrustation. Even for domestic purposes this incrustation is very inconvenient, as it cannot be removed in cleaning, (at least from narrow-mouthed vessels), and every time the vessels are used, a fresh layer is deposited, which adds to the thickness of the former crust. In boilers, this circumstance is doubly inconvenient; first, because the tendency towards the formation of this deposit is much facilitated by the evaporation; and, secondly, because its injurious effects are much more extensive and dangerous. In a steam-boiler, from one period of cleansing to the next, the total amount of the fixed mineral ingredients, contained in the quantity of water supplied to it, remains, while the pure water and the gases alone are evolved. If 1,000 gallons of water, like No. 16, be evaporated from a boiler in 24 hours, a residue would be left of one pound. But if an equal quantity of water, like No. 22, had been evaporated, the amount deposited would have been *three* pounds. In either case a portion of the solid matter would be mechanically expelled with the steam, leaving, however, by far the greater portion to settle down as an incrustation, which very soon becomes burnt in. In a short time the wrought iron of the boiler will not communicate the heat it receives from the fire directly to the water in its interior, but to the badly conducting solid incrustation, and the water will consequently be less quickly heated. It readily happens, under these circumstances, that a portion of the iron, notwithstanding the boiler is well supplied with water, becomes red-hot, and should a part of the incrustation become detached, the water would come into sudden contact with the red-hot iron, giving rise to the instantaneous formation of an excessive amount of steam, and an explosion may ensue. In steamboats where river water, containing, in addition to the salts in solution, a large quantity of suspended solid matter, or sea-water, is employed for feeding the boiler, the evil is very much increased.

Secondly, *Organic Substances.*—These are the most objectionable impurities to be found in ordinary waters. Any ordinary water, containing less than 15 grains of mineral matter in a gallon, may be regarded as comparatively pure, and may be employed for domestic purposes, provided it does not contain a large proportion of organic matter. By referring to table B, it will be observed that the waters, marked 20, 21, 22, 23, contain, respectively, $4\frac{1}{3}$, $4\frac{1}{8}$, $4\frac{1}{2}$, $4\frac{2}{3}$ grains of organic matter to the gallon. The presence of this quantity of organic matter in these waters renders them unfit for domestic use, unless purified, as a considerable proportion of their organic matter is of animal origin.

These organic substances, in most cases, are of vegetable origin, and are derived from the solvent action of rain and spring waters upon the vegetable substances through which they percolate in passing from their various sources into lakes and rivers. Hence the waters of lakes and rivers contain more of these impurities than those of springs. In populous districts substances of animal origin likewise find their way into the waters of lakes, rivers, ponds, and wells. It often happens that, in the neighborhood of dwellings and farm-yards, and especially in towns, the water of wells becomes very impure and even unwholesome to drink. The rains that fall upon the filth that accumulates in towns, wash out these soluble substances it contains, carry them into the soil, and through this, by degrees, to the wells by which the wants of the inhabitants are supplied. This has often been productive of serious and fatal diseases. It shows, therefore, the propriety of preventing, as far as possible, the accumulation of refuse; and, where such accumulation is unavoidable, of placing it at the greatest distance from wells which yield water for daily use. And especially it shows the necessity of bringing water from a distance for the supply of large cities.

In the neighborhood of grave-yards water may become adulterated with undesirable admixtures. The water of a well, close to an old church-yard, has been found to contain as much as 100 grains of solid matter to the gallon, more than one half consisting of *nitrates*, traceable to the neighboring grave-yard. Such compounds are generally produced where animal matters decay in porous soils.

The following table exhibits the proportion of organic matter (also mineral matter), found in certain well known English and American waters, arranged in the order of their purity in reference to organic matter:

	Croton hydrant water, N. York.	Schuylkill water Philadelphia,	Chicago water—No. 16.	Fresh pond water, Cambridge, Massachusetts.	Cochituate water, Boston.	Mean of 4 English Rivers.	Chicago water—No. 23.	Thames water at London Bridge,
MINERAL MATTER,.........	3.70	4.25	6.74	5.00	1.69	14.49	16.06	17.53
ORGANIC MATTER,.........	.46	1.24	1.27	1.35	1.43	2.15	4.69	5.83
Total Solid Matter,	4.16	5.49	8.01	6.35	3.12	16.64	20.75	23.36

Thirdly, *Gaseous Substances.*—These were found to be oxygen, hydrogen, carbonic acid gas, and sulphuretted hydrogen. The first three were in all the samples of water examined. They are, indeed, in nearly all natural waters. Traces of sulphuretted hydrogen were detected in Nos. 20, 21, 22 and 23, generated from the decomposition of the animal matter which they contained.

Fourthly, *Sedimentary Substances.*—All the samples contained sedimentary matter. The respective amounts appear in table B.

All which is respectfully submitted,

BLANEY & MARINER,

Chemists.

TABLE A.

No. of Water,	1	2	3	4	5	6	7	8	9	10	11	12
Organic Matter,	2.8794	1.7171	1.9180	1.6917	1.7435	2.0688	1.9280	2.2521	2.0086	1.9543	1.6111	1.7707
Mineral Matter,	10.5771	10.1285	8.7965	7.4212	7.3093	7.5409	7.9966	8.4502	7.3435	9.8851	8.7825	9.0782
Total Solid Matter,	13.4565	11.8456	10.7145	9.1129	9.0528	9.6097	9.9246	10.7023	9.3521	11.8394	10.3936	10.8489
Sulphuric Acid,	.3596	.3101	.1898	.1960	.1713	.1744	.1666	.2083	.1700	.3518	.2199	.2295
Sodium and Potassium,	.2432	.2311	.2088	.2472	.2435	.3734	.3867	.2778	.2359	.2226	.1978	.3077
Chlorine,	.0754	.0372	.1534	.1398	.0420	.0971	.0250	.0909	.1089	.0596	.0833	.0862
Silica,	4.1445	4.0756	2.6665	.9536	1.0724	1.4350	1.6263	1.5091	1.2606	1.4010	.9381	1.5291
Lime,	2.5892	2.3364	2.2867	2.3947	2.1185	2.5676	2.2960	2.4148	2.5413	2.9055	3.1848	2.8252
Magnesia,	.5887	.6311	.7684	.7854	.7730	.7283	.9289	.9854	.7124	.8460	.7437	.9505
Per-Oxide of Iron and Alumina and Phosphates,	.4197	.1327	.3086	.1636	.8039	.0231	.0185	.1420	.0988	.0895	.1157	.4552
Carbonic Acid (combined,)	2.4619	2.3365	2.5099	2.5094	2.3928	2.6963	2.7006	2.8312	2.6612	2.9895	3.1727	2.0395

No. of Water	13	14	15	16	17	18	19	20	21	22	23
Organic Matter,	1.4158	1.4653	1.9909	1.2727	2.2785	2.4467	1.7956	4.3422	4.1247	4.5965	4.6941
Mineral Matter,	8.3729	8.5318	8.1495	5.9593	8.1398	9.2461	7.4315	15.2823	17.2659	18.0115	14.7507
Total Solid Matter,	9.7887	9.9971	10.1404	7.2320	10.4183	11.6928	9.2271	19.6245	21.3906	22.6080	19.4448
Sulphuric Acid,	.3040	Trace	.2561	.3024	.4397	.4660	.1960	.3703	1.3131	1.2282	.7190
Sodium and Potassium,	.1501	.2191	.2129	.1389	.3965	.3456	.2393	1.1295	1.2581	1.3517	1.0651
Chlorine,	.0375	.0642	.1529	.2083	.0298	.2392	.1134	.3796	.0214	.4209	.1449
Silica,	2.5552	2.7681	1.7930	.3512	1.5507	2.6493	1.5430	2.0701	2.9764	6.3001	3.3992
Lime,	2.8176	2.7882	3.0053	2.4796	2.2682	2.1124	1.5106	3.6368	4.3759	3.3653	3.6538
Magnesia,	.3472	.5748	.5956	.6789	.6589	.8517	.7052	1.7096	1.9010	.8979	1.7544
Per-Oxide of Iron, and Alumina and Phosphates.	.1173	.0694	.0197	.0756	.2376	.1389	.1944	.3450	.3561	.3009	.6342
Carbonic Acid, (combined,)	2.4160	2.8023	2.8541	2.5043	2.2413	2.3096	1.8394	4.4728	4.7385	2.9239	4.3421

TABLE B.

No. of Water,……………………	1	2	3	4	5	6	7	8	9	10	11	12
Sulphate of Lime,…………..	.6113	.5272	.3227	.3332	.2912	2965	.2832	.3541	.2890	.5981	.3738	.3901
Carbonate of Lime,…………	4.1731	3.7843	3.8460	3.9312	3.5689	4.3669	3.8917	4.0518	4.3255	4.7485	5.4123	4.6352
Carbonate of Magnesia,……	1.2150	1.3026	1.5861	1.6210	1.5956	1.5032	1.9172	2.0338	1.4704	1.7462	1.5350	1.9618
Silica, …………………………	4.1445	4.0756	2.6665	.9536	1.0724	1.4350	1.6263	1.5091	1.2606	1.4010	.9381	1.5291
Per-Oxide of Iron, Alumina and Phosphates,	.4197	.1327	.3086	.1636	.8039	.0231	.0185	.1420	.0988	.0895	.1157	.4552
Chlorides of Sodium and Potassium,	.1242	.0613	.2528	.2304	.0692	.0600	.0412	.1498	.1794	.0982	.1373	.1421
Organic Matter, ……………	2.8794	1.7171	1.9180	1.6917	1.7435	2.0688	1.9280	2.2521	2.0086	1.9543	1.6111	1.7707
Soda. (combined with Organic matter,)	.2621	.2792	.1476	.2112	.2917	.4188	.4997	.2953	.2230	.2482	.1940	.3396
Total Solid Matter,……	13.8293	11.8800	11.0483	9.1359	9.4364	10.1723	10.2058	10.7880	9.8553	10.8840	10.3173	11.2238
Free Carbonic Acid,(cub.in.)	9.8243	12.2632	8.4235	10.0004	8.1298	8.9394	7.1503	5.7201	5.7231	6.2491	10.5524	12.6058
Sedimentary Matter,………	4.9633	2.8725	1.7333	3.1055	3.2244	3.2403	4.4372	2.9404	………	………	………	………

No. of Water,……………………	13	14	15	16	17	18	19	20	21	22	23
Sulphate of Lime,…………..	.5168	Trace	.4354	.5141	.7475	.7922	.3332	.6295	2.2323	2.0879	1,2223
Carbonate of Lime,…………	4.6514	4.9789	5.0464	4.0498	3.5007	3.1896	2.4525	6.0314	6.1726	4.4743	5.6259
Carbonate of Magnesia,……	.7166	1.1863	1.2293	1.4013	1.3599	1.7580	1.4554	3.5167	3.9236	1.8525	3.6211
Silica,…………………………	2.5552	2.7681	1.7930	.3512	1.5507	2.6493	1.5430	2.0701	2.9764	6.3001	3.3992
Per-Oxide of Iron, Alumina and Phosphates,	.1173	.0694	.0197	.0756	.2376	.1389	.1944	.3450	.3561	.3009	.6342
Chlorides of Sodium and Potassium,	.0618	.1058	.2520	.3433	.0491	,3942	.1869	.6256	.0353	.6936	.2388
Organic Matter,………………	1.4158	1.4653	1.9909	1.2727	2.2785	2.4467	1.7956	4.3422	4.1247	4.5965	4.6941
Soda, (combined with Organic Matter,)	.1397	.2394	.1535	.0053	.5088	.2571	.2236	1.1917	1.6782	1.4554	1.3100
Total Solid Matter,……	10.1746	10.8132	10.9202	8.0133	10.2328	11.6260	8.1846	18.7522	21.4992	21.7612	20.7456
Free Carbonic Acid,(cub.in.)	7.3262	8.0594	8.7926	7.4115	10.4251	10.5067	12.3286	14.1765	24.7356	26.3973	22.2541
Sedimentary Matter,………	.3564	.2973	.3544	.1882	.8023	.6789	1.8515	2.0047	2.6435	5.0659	4.3556

REMARKS.—No. 1 is colored by organic matter; so also are Nos. 8, 20, 21, 22 and 23. Nos. 20, 21, 22, and 23, on standing, became fetid and turbid, from the decomposition of animal matter, but finally purified themselves by spontaneous fermentation, becoming clear and odorless, and not unpalatable.

bash avenue, thence along Wabash avenue to Adams street. Here a 16 inch branch is placed, and the end of the 24 inch pipe—which may be extended southward hereafter—is capped. From the branch a 16 inch pipe is laid along Adams street to State street, where it is connected by a 12 inch branch with the old State street 12 inch main, the branch having a 12 inch stop-cock to break the connection when desired. From this branch, the 16 inch pipe continues along Adams street to the alley on the east side of the Reservoir lot. Here it comes into the lot, and runs along the west side of the old main to the Reservoir, where it re-crosses the old main, passing through the the same archway to the center of the foundation of the Reservoir, and thence vertically into the bottom of the tank, through a flue that was left for the purpose of emptying the Reservoir. A 16 inch stop-cock was put on this pipe inside of the Reservoir.

The completion of the new main was delayed more than two months, first by the failure of the contractors for the pipes with regard to time, and secondly by the breaking or bending of the screws of all the new stop-cocks. Two pipes proved defective after they were laid, but not a single leak has yet occurred in consequence of defective workmanship in making joints. The laying of this pipe was under the immediate charge of Mr. John Costello, who has also had charge of the laying of all the pipes put down, together with all the repairs made of them for several years past.

DISTRIBUTING PIPES

Have been laid down in the year as follows, viz :—

SOUTH DIVISION.

STREETS.	BETWEEN WHAT STREETS.	Diameter of Pipe.	No of feet,
Michigan Avenue,	Ringold Place and Palo Alto street.	6 inch.	642
Dearborn Street,	New and Cross streets,	4 "	838
Arnold "	North and Cross streets,	4 "	1270
Prairie Avenue,	North and Old streets,	4 "	817
North Street,	Arnold and Clark streets,	4 "	230
	For Hydrants,	4 "	180
	Total,		3,977

NORTH DIVISION.

STEEETS.		BETWEEN WHAT STREETS.	Diameter of Pipe.		No. of feet.
Franklin	Street,	North avenue and Schiller street,	4	inch.	1250
Wisconsin	“	Wells street and 500 feet northward,	4	“	838
Huron	“	Market and Wells streets,	4	“	495
White	“	Market and Franklin streets,	4	“	408
High	“	Wells and La Salle streets,	4	“	425
La Salle,	“	High street and 75 feet southward,	4	“	71
Ontario,	“	St. Clair street and 355 ft. eastward,	6	“	351
		For Hydrants,	4	“	120
		Total,			3,958

WEST DIVISION.

STREETS.		BETWEEN WHAT STREETS.	Diameter of Pipe,		No. of feet,
Jefferson	Street,	Forqua and Judd streets,	6	inch.	1410
Polk	“	Blue Island Av. and Morgan street,	6	“	538
Prairie	“	Green and Peoria streets,	4	“	319
Paulina	“	Warren street and 227 ft. northward,	4	“	224
Halsted	“	Mitchell and Catharine streets,	6	“	643
Catharine	“	Halsted and Union streets,	4	“	506
Peck	“	Lake and Fulton streets,	4	“	427
Fulton	“	Peck and Sheldon streets,	4	“	500
Halsted	“	Polk street and 531 feet northward,	4	“	527
Wilson	“	Canal street and Stewart avenue,	4	“	572
		For Hydrants,	4	“	160
		Total,			5,826

The total length of main pipe laid the past year is as follows, viz:

24	inch	cast iron pipe, between the engine house and the south side of N. Water street,	2,597 ft.
24	“	wrought iron pipe at engine house,	12 “
24	“	“ “ “ between south side of N. Water St. and River pipe,	104 “
24	“	wrought iron River pipe,	426 “
24	“	cast iron pipe between south side of River and south side of Adams street,	3,484 “
16	“	cast iron pipe on Adams street between State street and South Reservoir,	1,610 “
			8,233 ft

The total length of pipe of different sizes *in the city*, as nearly as can be ascertained, is as follows, viz:

24 inch	cast iron main pipe, ...	12,265 ft.
16 "	" " " "	10,610 "
12 "	" " " "	9,830 "
30 "	wrought iron river pipe, State street,...............	280 "
24 "	" " " " Chicago avenue,..........	236 "
24 "	" " " " Rush street,...............	530 "
12 "	" " " " Adams street,........... .	176 "
12 "	cast iron distributing pipe,.........	364 "
10 "	" " " "	7,862 "
8 "	" " " "	33,581 "
6 "	" " " "	158,521 "
4 "	" " " "	238,486 "
3 "	" " " "	30,388 "
		503,129 ft.

or ninety-five miles and 1,522 feet.

HYDRANTS.

During the year the following new hydrants have been put in, viz:

SOUTH DIVISION.

1 Hamilton, S. W. cor. Michigan avenue and Ringold street.
1 " W. side Sherman street between Polk and Taylor streets.
1 " N. W. cor Griswold and Taylor streets.
1 " N. W. cor. Rio Grande street and Douglas avenue.
1 " S. W. cor. New and Dearborn streets.
1 " S. W. cor. Old and Arnold streets.
1 " S. W. cor. North and Arnold streets.
1 " S. W. corner North street and Prairie avenue.
1 Cregier, Skating Pond W. side Michigan avenue.

NORTH DIVISION.

1 Hamilton, Franklin between Schiller street and North avenue.
1 New York, N. W. cor. Water and Dearborn streets.
1 Hamilton, N. E. cor. Wells and Menomonee streets.
1 " N. side White street between Green Bay road and Lake.
1 " S. W. cor. High and La Salle streets.
1 " E. end Ontario street, (Skating Pond.)

WEST DIVISION.

1 Hamilton, W. side Loomis between Van Buren and Tyler streets.
1 “ N. E. cor. Walnut and Wood streets.
1 “ S. W. cor. Jefferson and Dekoven streets.
1 “ N E. cor. Morgan and Polk streets.
1 “ S. W. cor. Wright and Halsted streets.
1 “ N. W. cor. Union and Catharine streets.
1 “ N. W. cor. Sheldon and Fulton streets.
1 “ N. W. cor. Wilson street and Stuart avenue.

In all 23, making, together with those previously put in, a total of 469 in the whole city.

The number of Hydrants taken out to be repaired was 55, or about one in 8½ of the whole number in the city. Considering how seldom these are used for fires, the number repaired appears large. The carelessness or unskillfulness of the street sprinklers is probably the greatest cause of the hydrants getting out of order. The next is probably that of the firemen, some of whom in the hurry and excitement of their calling, are unmindful of the care with which they should be used. The repairs mentioned are not those that require merely the putting in order of slight derangements, a frequent necessity, but those that require the hydrant to be taken out of its socket, an operation which causes considerable labor, and makes it necessary to shut off the entire district in which the hydrant is located.

The Cregier hydrant, devised for the purpose of avoiding this necessity of shutting off the whole district, mentioned in the last Annual Report of the Water Commissioners, has been completed and promises to work well. I would recommend the trial of several of them in those localities where repairs have hitherto been most frequently needed.

Much pains is taken to keep the hydrants from freezing, by packing around them with manure in the beginning of winter, and by frequent examinations during very cold weather. Most of those found frozen are in boxes that are not drained, and consequently partly filled with water. Where sewers have been laid near hydrants, it is most desirable that the boxes around the latter should be connected with the former, as in excessively cold weather it is impossible with a reasonable force to keep all the hydrants constantly free.

STOP-COCKS.

The following stop-cocks have been put in during the year, viz :

SOUTH DIVISION.

1 Hamilton, 8 inch Blow-off near Rush street Bridge.
1 New York, 12 inch State and Adams streets.
1 " 16 " South Reservoir.
1 " 24 " Near Rush street Bridge.

NORTH DIVISION.

1 New York, 24 inch in Engine House.
1 " " " outside of Engine House.
1 " " " Water and Pine streets.

WEST DIVISION.

1 Walker, 6 inch Desplaines and Adams streets.

Eight in all, and, together with those previously put in, making a total of 221 in the whole city.

Nine stop-cocks have been repaired, and quite a number of others need it, but it would not be advisable to attempt it before spring. In several parts of the city more stop-cocks should be put in, where the districts it is necessary to shut off in case of repair, have become too large; besides, by increasing the number of districts, not only is the labor of shutting off diminished, but also the risk of having to shut off two or more districts, in consequence of stop-cocks being out of order.

In view of the number of old stop-cocks to be repaired, and new ones required, as well as other kinds of work frequently needed, it has been thought best to establish a small work shop at the pumping works. This is now nearly ready for use, and there is every reason to believe that it will cause a material saving in the first cost of stop-cocks, and perhaps of hydrants. But in case it should not, the certainty of getting our work well done, and *at the time* it is needed, will be of great value.

A shop of this kind has been found very serviceable on the Boston Water Works during the last ten years, and has been recommended twice heretofore for our own works by the late Superintendent, Mr. Walker, in his annual reports.

RESERVOIRS.

The north and west Reservoirs are and have been in good order during the past year. The south reservoir leaked so badly in the summer, that it was found necessary to repair it thoroughly before filling it through the new main. This was supposed to be done about the 10th of October, when the reservoir was filled, and new leaks were discovered. It was used for sometime, however, but when dampness showed itself through the outside walls, it was determined to make further repairs. These have been completed and the water again let on. A very great improvement has been made, still a few leaks exist which it will not probably be necessary to repair before spring. The difficulty with this reservoir is owing to the quality of the English iron used, which, it is now very clearly seen, was unsuitable for the purpose. It may be necessary to put in an entirely new bottom before making it tight, but it is still hoped that this expense may be avoided for a few years.

The ground around the south reservoir has been enclosed by a substantial picket fence, which has not only greatly improved its appearance, but has added much to its value as a place for keeping water and sewerage pipes. A commencement has been made towards grading it up with street dirt. When this is completed, a good part of it may be sown down in grass and otherwise ornamented at a small expense.

Previous to the completion of the new main, the south reservoir was of very little use, as it was found impossible to get more than a few feet of water in it, and that generally in the night, while during the day it stood most of the time below the bottom of the reservoir. Since the completion of the new main, no difficulty is found in filling this reservoir to overflowing in the day time, especially when the large engine is at work.

QUALITY OF THE WATER.

With the exception of turbidness during and shortly after easterly storms, the quality of the water furnished has generally been very good; but there have been occasional exceptions, the most important of which are owing to three different causes.

First, after a long continuance of snow and ice, a thaw and rain are sure to be followed by an unpleasant smoky taste in the water, lasting from one to two days. This happens seldom more than twice in a winter, and sometimes not more than once.

Second, the "*fish nuisance*," as it has been generally called. This has never been so annoying before as it has been this winter. In December they came in such quantities as to choke up the only screen that was effectual in keeping them out of the pumping well, and in order to prevent the pumps from sucking air instead of water, it was found necessary to remove this screen, which being in the grooves intended for a stop gate, could not be cleaned without being taken out, and the very act of taking it out necessarily let all the fish accumulated above it pass through. It was hoped and believed, judging from the experience of previous winters, that the trouble would cease in a shorter time than any thing effectual could be done in at the entrance of the inlet pipe. At this point three screens had been put in, with conveniences for taking one out at a time to be cleaned, while the others stopped the passage of fish or other substances. But the bottoms of these screens had been undermined, and the protection to the inlet supposed to be otherwise so much injured by the ice, as to render any attempt at effectual repairs hopeless. But as the nuisance continued, and caused the hot water from boilers connected with the works to be peculiarly offensive, and sometimes causing even the cold water to taste, to say nothing of the offensive sight of so many dead and mangled fish coming from the taps in nearly every part of the city, an attempt was made to close up the openings under the screens by means of stones, gravel and canvas; first building a shanty over the screens to shelter the laborers. Men were then set to watch the screens at the inlet night and day, and the screen that had been taken up near the engine house was put in its place again. This appeared at the time to be effectual, as the screen near the engine house did not become foul. In about three days after the work was done, the fish ceased to trouble us at the inlet. The pipes all over the city were flushed out by means of the fire hydrants, and the reservoirs thoroughly cleansed. The cold water immediately became free from offensiveness to sight, smell or taste, and the boilers gradually lost their disagreeable odor. After we had begun to congratulate ourselves upon the purity of the water, and that the fish would not trouble us again this season, they re-appeared suddenly, through previously undiscovered openings, in great multitudes, and made it necessary to take out the screen near the engine house. This was very early on the morning of the 7th inst. After being cleansed the screen was put back, but becoming foul again in the afternoon, it was broken in the attempt to take it out. By keeping men day and night at the inlet a great many fish were caught, and a repetition of the nuisance on anything like the former scale was prevented. After three or four days the fish ceased to appear in great numbers, and we trust no serious inconvenience will arise from them again this winter, and before another it is intended to erect such a structure as will prevent the possibility of a recurrence of the evil.

Third, the most serious cause of impurity is believed to be the river. There have been several occasions during the last three years when many persons thought they could perceive the effect of the river in the taste of the water, but not until the night of the 10th inst., and during several days since, did that effect become so striking as to convince all who have examined into it of its real nature. On the morning of the 10th, the wind being from the south and westward, the Lake fell to an unusually low point. This, of course, caused a very large amount of water to be discharged from the river into the Lake, producing the well known disagreeable effect upon its taste and smell, so that it could be distinctly perceived along the shore, from a considerable distance south of the river, to the cemetry on the north. Since the 10th the water has twice been free from this taste and smell, and twice has it become offensive. The taste thus given to the water supplied to the city is much more offensive than that caused by the fish, while it is utterly impossible by any means at the disposal of the Board to prevent it at present.

Two questions immediately arise; what means have the Board of preventing it in the early future, and how can the earliest possible relief be obtained? Before discussing these questions it may be better to dwell upon the causes of the present, and former offensive states of the river.

The discharge of the sewers into the river, will at once be pointed at as the great cause, and the late Board of Sewerage Commissioners in the plan which they adopted, with the concurrence of the City Council, took the ground that the time would come when the discharge of all the sewerage of the city into the river would make it offensive, and provided a plan for correcting the evil; that of a constant infusion of fresh lake water into the river by means of steam power.

But while the sewers have undoubtedly had their share—and a very important one too—in corrupting the river, another cause, which did not in 1855, if it does now, legally exist, has tended most powerfully to produce the present state of things; and that is the wholesale discharge of blood, and other refuse from the slaughter and packing houses, in and around the city, besides distilleries, glue factories, establishments for rendering offal, &c.

It may seem to some idle to attempt to separate the effect of the packing houses, &c., from that of the sewers, but the following well known facts will make it clear that the effect of the former can be distinctly traced. Last spring the river became quite offensive in smell, and a committee was appointed by the City Council to confer with the officers of the canal in relation to changing the water in the river by pumping at Bridgeport. It so happened that before any arrangement was made it became necessary to pump to supply the wants of the canal itself, and nothing more was done by the city. During the whole summer and the early part of autumn, the river, though receiving its full amount of sewerage, did not become so offensive at any time as to be a cause of complaint. Very soon, however, after the packing season commenced, a most disagreeable odor was observed near the Old Street Bridge, on the South Branch, which is *above* the outlet of any existing sewer. This peculiar odor could be traced afterwards, as it moved down stream, till it reached the mouth of the river.

As an additional proof that the sewers do not cause all the bad smells, it may be here mentioned that in 1860 the discharge from piggeries and cow stables high up on the North Branch, made that stream exceedingly offensive to its mouth. It is also very offensive this winter, and yet there is not a single sewer emptying into it at ordinary times, and only two, those on West Kinzie and Fulton streets, that do in times of heavy rains.

Many of the older inhabitants of Chicago no doubt remember that before any sewers were built, and when the packing business was in its infancy compared with its present state, the river became so offensive from the discharge of blood and other refuse into it, as to lead to the passage of a city ordinance forbidding it.

Another reason can be given for the excessively offensive state of the river this winter, as compared with what it was last summer. It is well known that water will become purified from offensive organic matter by simply letting it stand in contact with the air a sufficiently long time; hence the more rapidly it can be brought into contact with the air, the more rapidly it becomes purified. Now during the summer the surface of the river was not only uncovered, but frequently agitated by the passage of tugs and other vessels, which tended powerfully to purify it. But during much of the winter the surface of the river has been covered with ice, and consequently the air has been almost entirely excluded from it. It has been like a bottle with two mouths, which, originally filled with comparatively pure water, but receiving only continual accessions of filth into one mouth, soon ceases to discharge anything but filth from the other.

The late Board of Water Commissioners directed their attention to the complaints of injury to the water pumped up for the city "from the wash of the lake shore and the flow of the river," and caused surveys and estimates to be made and plans to be discussed. By reference to their report of Jan. 1st, 1861, p. 28 to 44, it will be seen that five plans were estimated for. These are:

1st, Extending a pipe a mile out into the lake.
2d, Making a tunnel the same distance.
3d, Removing the pumping works to Winetka.
4th, Constructing filter-beds.
5th, Constructing a subsiding reservoir.

None of these plans were recommended for immediate adoption, but it was thought best to wait another season, and test by chemical analyses whether the effect of the river as far up as the pumping works was really appreciable or only imaginary. These analyses have been made with great care and labor by Drs. Blaney & Mariner, and their report is before you.

Neither of the plans above mentioned could be made available for present relief, and it is yet uncertain which, upon the whole, it would be best to adopt. That of removing the pumping works to Winetka (or perhaps to a point a few miles nearer—say nine or ten miles north of the city)—would undoubtedly give entire freedom from the effects of the river and the wash of the city shore, but its cost would be so great as to make it advisable, if not absolutely necessary, in the present state of the city's finances, to inquire if such an outlay cannot be avoided.

The late Board of Sewerage Commissioners not only embraced in their original plan a method of preventing the river from becoming offensive from sewerage, which the result of pumping at Bridgeport proves would be effectual, but kept the subject continually in mind, as their late published reports will show. In that for the half year ending June 30, 1860, p. 16 and 17, will be found what was then believed to be the best plan to keep the river free from offensiveness; and that was to make an arrangement with the Canal Board to keep their pumps in operation so much of the time during six months of the year as might be necessary to preserve the river from smelling bad, though the wants of the canal might not require it. The experience of the present winter shows that such an arrangement should be extended so as to embrace occasional pumping in winter, if practicable then, as well as in summer.

The above plan, as will be seen by referring to the report mentioned, was not recommended as a permanent one, but simply as the most advisable expedient for a few years to come, giving time to settle several important questions relative to the future of Chicago, before adopting a more permanent, thorough and necessarily costly plan. The questions alluded to are the probable growth of Chicago, the direction of that growth, the harbor improvements that may be adopted, the construction of the proposed ship canal to the Illinois River, and the necessity or expediency of imitating the great sewerage intercepting scheme of London, now being carried out. The light which a few years will throw on these questions would be of immense advantage to Chicago, in the planning of permanent works to remove the evils now complained of.

The analyses of Drs. Blaney & Mariner are not quite so extensive as was thought desirable last year, but this has been owing to the war, which first took away Dr. Mariner as a three months' volunteer, and afterwards occupied all the time of Dr. Blaney as Surgeon and Medical Purveyor. Still their analyses, as far as they have gone, are very thorough, and, while confirming some theories held before, have corrected others.

The theories confirmed are not only the one that the water of the lake is the purer the further you take it from the shore, but the one that impurities are greater, within the city limits, south of the river, than at a much less distance north. Perhaps a larger number of analyses might modify the latter statement somewhat. The fact that on the 17th of April last, water taken from the river at Clark street bridge was purer than that taken from the lake, opposite Cleaverville and one thousand feet from the shore, is certainly very striking, and shows how great an effect the rains of spring have on the river. In November and now, not only analyses but our senses show a very different

One theory corrected is that there is less organic matter in our lake water, say not more than a mile from the shore, than there is in that furnished to New York, Philadelphia and Baltimore; there is in reality more. It is also greater than that supplied by the London Water Companies in 1856. Another theory a non-professional person is apt to hold is that the offensive water taken from "dead ends" in the city pipes contains a greater amount of impurities than that which is not offensive and taken from pipes having a free circulation; but analysis shows less organic matter, the offensiveness being due, not to its quantity, but to the change it is undergoing. The actual diminution of organic matter is supposed to be owing to the action of the iron pipes.

Another striking peculiarity of the lake water is the large amount of silica it contains, and to this is owing its peculiar effect upon boilers, besides that which the lime it contains is known to exert. The river water also contains very large proportions of it at times.

But the analyses and report are worthy of careful study, without which they can neither be appreciated nor understood. Such a study indicates that further examinations should be made.

Appended to the analyses will be found a statement of the places from which each specimen of water was taken, together with the date when it was taken. This statement was purposely withheld from the chemists, that they might not be influenced in their course of investigations by previously formed theories; hence the absence of any attempt to explain apparent anomalies.

Much of the impurity complained of and shown by the analysis to exist near the shore, might be avoided by laying a pipe about 1000 feet out into the lake, to the edge of navigable water. This was suggested, p. 41 and 42, of the last annual report of the Water Commissioners, and a rough estimate of its probable cost ($30,000) was given.

The first freshet will no doubt purify the river, and restore it to the state it was in last April. This will be a natural relief, and may be expected soon.

In concluding this article on the quality of the water, what has been said may be thus summed up:

1st, The smoky taste occurs so seldom as not to be a serious matter.

2d, The fish nuisance can and no doubt will be entirely prevented before next winter.

3d, The very disagreeable taste and smell occurring at three different times during the last two weeks, and lasting two to three days each time, evidently proceeded from the river.

4th, The offensive state of the river this winter, is due very largely to the great quantity of blood and other refuse discharged into it from packing houses, distilleries, &c.

5th, Pumping at Bridgeport would bring the speediest, and would be the most economical temporary relief.

6th, It is exceedingly desirable to postpone the adoption of very expensive permanent plans a few years till more light can be obtained on the several questions before mentioned.

7th, The analysis shows, what was known to chemists before, that an offensive taste and smell in water, is owing not so much to the quantity of organic matter present, as it is to its condition of life or decay.

8th, Natural relief may be expected soon from the thaws and rains of spring, which must change the character of the water in the river.

METERS.

There are now in use in the whole city 10 Meters. They are all of the Worthington Patent, and of the following sizes, viz:

2—⅝ inch.
5—1 inch.
2—2 inch.
1—3 inch.

Wherever it has been thought best to introduce them, and they have been kept in order a sufficiently long time, they have more than paid for themselves by the increased rates they showed should be charged. In a few instances they have been prevented from working by grit and sand in the water. A contrivance for preventing this is now under trial, and if it should succeed, as we hope it will, we can attach meters again to some of the largest hotels where they failed before, and where it is very desirable to have them.

A surprising case showing the importance of water meters, is mentioned, page 10, of the Annual Report of the Cochituate Water Board, (of Boston), just published. It was found by trial that five water closets at a railroad station, for which $25 a year had been paid, used water enough to amount to $1,802 a year.

SEWERAGE.

The amount of work done in this department during the year 1861, was very much less than was done any previous year. Extensive preparations were made in May last for putting under contract a number of sewers in sections of the city where they were very much needed; but in consequence of the currency troubles which then came on, the further prosecution of the work was stayed.

Three fourths of the small amount of sewers actually built was owing to advances for their construction by interested parties. The following is a description of them:

	CONSTRUCTION.						REPAIRS.		
LOCALITY.	Date	5 foot Sewer built	3 foot Sewer built	2 foot Sewer built	1 foot Sewer built	Catch Basins built	Lin. ft. Sewers repaired	No. of Catch basins repair'd	No. of Man Holes altered
SOUTH DISTRICT.									
Harrison Street, East from River	May		50ft						
Clark Street, at corner of North	April				10ft				
Lake Street, State to Franklin	Oct. & Nov.				1531ft				
Catch Basins in South District						13			
Totals in South Eistrict			50ft		1541ft	13	70ft	60	90
WEST DISTRICT.									
Adams Street, between River and Canal	April	50ft							
Beach Street, between Polk and Ewing	May			286ft					
Stuart Avenue, between North and Meager	July			445ft					
Monroe Street, between River and Canal	April			15ft					
Aberdeen, between Madison and Monroe	June				269ft				
Catch Basins, Beach, Randolph, Stuart Av						5			
Total in West District		50ft		746ft	269ft	5	10ft	134	49
NORTH DISTRICT.									
Cass Street, from Chicago Av., South	June				70ft				
Pine Street, from Pearsons Street, North	August				100ft				
Totals in North Districts					170ft		10ft	221	
Totals of Three Districts		50ft	50ft	746ft	1980ft		90ft	415	139

Mr. Wm. H. Clarke, Asst. Engineer of the Board, who, in addition to his other duties connected with the sewers, has had special charge of private drains for the last two years, reports the following in relation to them:

"RETURN OF PRIVATE DRAINS LAID DURING THE YEAR 1861.

	12 INCH.	9 INCH.	6 INCH
SOUTH DISTRICT.			
Twelve inch Drains	3		
Nine inch Drains		10	
Six inch Drains			132
NORTH DISTRICT.			
Twelve inch Drains	2		
Nine inch Drains		2	
Six inch Drains			49
WEST DISTRICT.			
Twelve inch Drains	2		
Nine inch Drains		2	
Six inch Drains			41
	7	14	222

There have also been during the year twenty-one drains extended and altered in the different districts, which have come to the knowldge of the department; some work of that kind probably having been done without due notice according to the regulations. The drain layers now licensed by the Board, who remain in the city, are generally trustworthy mechanics, and are disposed to do good work.

There have been less stoppages of drains during the past year than formerly, and such as occurred were due either to the introduction of improper substances into the soil pipes, or to the neglect of the catch basins. In the drainage of hotels and eating houses, the introduction of grease into the drains is still a frequent cause of stoppage."

LENGTH IN FEET OF SEWERS LAID TO DECEMBER 31st, 1861.

	SOUTH DISTRICT.		NORTH DISTRICT.		WEST DISTRICT.		
Diame'r in feet	Previous to 1861	1861	Previous to 1861	1861	Previous to 1861	1861	Total feet
6			3,895		1,292		5,187
5	361		4,761		17,040	50	22,221
4½					2,010		2,010
4	1,952		5,498		5,208		12,658
3	13,555	50	3,828				17,433
2½	19,478						19,478
2¼	6,359						6,359
2	20,258		34,409		30,429	746	85,842
1	64,684	1,541	25,057	170	23,503	269	115,224
	126,647	1,591	77,448	170	79,491	1,065	286,412

Or very nearly 54¼ miles; besides 1,192 catch basins with connecting pipes for receiving water from the streets, and 2,135 man holes for entering the sewers.

Two thousand four hundred and thirty-seven house and private drains have been laid and connected with the sewers. These have been laid by, or at the expense of the owners of the property drained. A much larger number might and ought to have been laid by this time, but for the last four years, property holders have generally been very averse to making avoidable expenditures.

Very little can now be added to the statements and suggestions relative to the future management of this department, made in the report of the Sewerage Commissioners for the half year ending Dec. 31st, 1860.

The condition of the river is described under the head of Water Works, where will also be found suggestions as to the causes of its present state and the remedy therefor. Soundings of the river have been taken this winter, and its general depth found to be as great as it was in 1855, before the sewers were commenced. The alteration in bridges and dock lines since then have caused material changes of depth in some places. The large amount of snow on the ground, in the country around Chicago, if it should go off suddenly by a rain or thaw, will no doubt scour the river very thoroughly, as well as entirely remove its offensive character for the time being.

The cleansing of the sewers has been less troublesome and expensive the past year, than it was the year previous, as will be seen by the following:

COST OF CLEANSING SEWERS AND CATCH BASINS.

YEAR.	SEWERS.		CATCH BASINS.		TOTAL.	
	Dolls.	Cts.	Dolls.	Cts.	Dolls.	Cts.
1859	1,492	59	479	00	1,971	59
1860	5,087	08	532	40	5,619	48
1861	4,199	85	1,274	18	5,474	03

The cause of the reduction of the cost of cleansing the sewers is partly owing to the more perfect removal of obstructions left in the sewers by unfaithful workmen, but still more to the efficiency of the new and large tank called "Garibaldi," which was constructed and is now used under the immediate direction of Mr. D. Knights, the Inspector of Sewers. By means of this tank, a small party of men and four horses, the smaller sized brick sewers can be cleansed in less than one-third the time, and one-half the cost required before. The pipe sewers were flushed before with a smaller tank, but the large one is much more efficient for them. Heavy deposits must still be taken from the larger sized brick sewers by manual labor, but these can easily be entered by men with wheelbarrows.

Which is respectfully submitted,

E. S. CHESBROUGH,

Chief Engineer.

SECRETARY'S REPORT.

Office of the Board of Public Works,
CHICAGO, ILL., FEBRUARY 24, 1862.

To the Board of Public Works of the City of Chicago:

GENTLEMEN:—I submit herewith the accompanying statements, showing the expenditures of the Board during 1861, and the financial condition January 1st, 1862, of all the departments under your charge. The statements have been made as much in detail as was practicable, without making them altogether too long.

Without attempting a full report of the doings of the office during the year, I avail myself of this opportunity to invite your attention to certain matters which seem to me to require your action.

The manner of enforcement of the collection of the water tax on buildings within the water district, but not supplied directly from the pipes, is by the present law burdensome and expensive, both to the city and the parties paying the tax. We now enforce the payment of the tax by the sale of the building or other personal property, which can never be effected for anything like their value, while the sale is without the relief of a possible future redemption. I would recommend that the tax be made less than it now is, and that it be made a lien upon the lot, and that if not sooner paid in, judgment be had against the lot at the same time as for other city taxes, preliminary to the sale of the lot at the annual tax sale.

There are now held warrants for some of such taxes extending back to the year ending May 1st, 1857, notwithstanding a great deal of labor has been expended during the past year in the effort to close them up. For the several years given below, the warrants amount as follows:

For the year May 1st, 1858 to May 1st, 1859, . .	$1,701 40
“ “ “ “ “ 1859 “ “ 1860, . .	4,371 82
“ “ “ “ “ 1860 “ “ 1861, . .	8,957 39
	$15,030 61

I have to recommend one other change in our water law, which, as well as that which I have already suggested, can be done only by enactment of the State Legislature. Probably no large city covers so much ground in proportion to its population as does Chicago. All our improvements are hence correspondingly large in proportion to the occupied property, and as the water tax is assessed only on such lots fronting where the pipes are laid as have buildings on them, it follows that a large share of the pipe laid is fronted by lots paying nothing, leaving the whole tax for interest and expenses to be borne by the occupied lots. Some idea of the difference between our own and other cities as to the relatively large extent of ground occupied by the population of our own city can be gained by a comparison of the amount of water tax received annually in several cities from each mile of pipe laid.

Name of Cities.	Miles of pipe all sizes.	Annual Water Receipts.	Receipts per mile of pipe.
Chicago, ...	95.288	$131,035 10 (1861)	$1,375 15
Cincinnati, ...	86.380	203,591 24 “	2,356 93
Boston, ...	131.295	342,138 75 “	2,605 87
New York, ...	280.270	765,954 35 “	2,732 91

Were the occupied property alone made to bear the burden of the street improvements, the sidewalks, the lighting of the streets, the sewers, &c., as is done now in regard to the water, the injustice of such unequal taxation would be felt sorely enough to be speedily remedied. The vacant lot is benefited by the introduction of the water as it is by the sidewalk or street improvement in front of it, by the gas-lighting, or by the sewer. Yet we tax the lot for its share of the benefits derived from all the latter named expenditures by the city, and do not tax it for the expense attending the conveying of the water to it.

Of the lots fronting the about 90 miles of distribution pipe laid in the city, 33 miles are vacant, and pay no water tax. From 33 miles of property fronting on the pipe, not one cent in return has yet been received, and the interest on the original outlay, and the expense of maintaining the same, and the hydrants, &c., are borne by that share of the pipe running in front of occupied lots.

The distribution pipe laid costs about one dollar per running foot. My own judgment and recommendation is that all the lots so fronting where pipes are or shall be hereafter laid, be taxed a sufficient amount to provide for the interest on the cost of the pipe as laid, or say from seven to ten cents per front foot of lots; and that for this purpose the necessary legislative authority be obtained as soon as possible.

The following extracts show the course pursued in several cities in dealing with the two kinds of property to which I have called your attention.

The New York law is similar to ours in taxing all buildings in the water district, but differs in that the tax is made a lien upon the lots as well as buildings.

Extract from Sec. 18, Act of April 11th, 1849, New York State Laws:

> "Such regular rents, when so established, shall be collected from the owners or occupants of all such buildings respectively, which shall be situated upon lots adjoining any street or avenue in said city, in which the distributing water pipes are or may be laid, and from which they can be supplied with water. Said 'regular rents' shall become a charge and lien upon such houses and lots respectively, as herein provided."

In Philadelphia when pipe is laid in any locality, the property fronting on the street where the pipe is laid, is taxed seventy-five cents per foot of lot, or one dollar and fifty cents per running foot of pipe, which is more than the cost of the pipe as laid here. Besides this, against every dwelling house on the line of the pipe, an annual water tax is assessed, unless the owners can show that the property obtains water from other sources than the City Water Department. I give herewith the law taxing for the first cost of the pipe:

Extract from an ordinance January 29th, 1855.

SEC. 1. That whenever any pipes for the conveyance of water shall be laid in any of the streets or highways within the city of Philadelphia, the owners of the ground in front whereof the same shall be laid, shall pay for the expenses thereof the sum of seventy-five cents for each foot of the front of the ground upon such street. *Provided*, that on all corner lots an allowance shall be made of one-third the length of one of their fronts, but such allowance shall be made on the street or highway having the longest front, and in case both fronts are of equal dimensions the allowance shall be made on the street in which the pipe shall be last laid; but in no case shall the allowance exceed fifty feet on any corner lot: *and provided always*,, that where a corner lot shall have erected upon it two or more seperate tenements there shall only be an allowance made equal to one third of the depth of the corner tenement and the yard adjoining."

In Cincinnati in addition to the water rent, a tax of ten cents per front foot of each lot on all streets where the pipe is laid, was collected last year. It is now under discussion to have the annual interest on the water debt and a certain amount for a sinking fund provided for by general city taxation, and to omit the front foot tax, there being a collection as usual from all parties using the water.

During the year rules were submitted to you for the organization of that part of the office having to do with the assessing and collecting of the water tax, the accounts and the receipts of money by the Board. These rules were approved by you and were intended to systematize the business of the office, and to throw as many guards as possible around the handling and accounting for money receipts. They work well, and I see now no reason for recommending any change in them.

As you are aware, it is a matter of much difficulty to test the actual water receipts with the amount of water rates assessed. A very considerable portion of the collections is from consumers whose rates are changeable—depending upon their amount of business and kind of business—and in actual practice from one cause and another, as many as twenty changes, some increasing and some lessening the amount to be collected on the books, will be made in one day. Such changes in the course of the year will probably number over a thousand, altering from day to day the amount of water rent recorded in the books at the opening of the year. The new water rent books have been prepared with the view of keeping account of all these changes, so that at any time a deduction of the uncollected water rents from the total to be collected, may show the actual cash collection of the office.

One other result I have for a considerable period striven to accomplish, which is, that we have plats of all the lots in the city, and on these plats a record of the buildings upon them; and that there be an annual examination of all the property of the water district. The finely executed atlas of the city prepared by Mr. W. P. Davie, for the Board, and on which he spent more than a year's labor, was the first step towards securing this result. The copying of the plats from this atlas on a larger scale, is a work of considerable time, and with the assessing is under the care of the assessor, Mr. O. F. Woodford. The whole work is in progress but can hardly be finished during the year unless the prepared plats are furnished to Mr. Woodford. I consider it essential to a complete and accurate assessment. As a considerable gain will result to the city, it is desirable that this re-assessing be brought about as soon as possible.

Very respectfully, sirs,

Your obedient servant,

A. W. TINKHAM.

Secretary.

Trial Balance, Ledger Board of Public Works, Dec. 31st, 1861.

WATER DEPARTMENT.

	Dr.	Cr.
Water Works, - - - - -	$1,074,338.94	
Water Works Income, - - -		$ 744,244 19
Water Loan Bonds, 6 per cent, -		1,030,000 00
Water Loan Bonds, 7 per cent, -		113,000 00
Water Loan Interest, - - -	379,861 72	
Water expenses and repairs, - -	270,508 89	
Discount on 6 per ct. Water Loan Bonds,	84,900 60	
Water Fund in hands of City Treasurer,	11,136 38	
Water pipes, - - - - - -	13,478 03	
Water Works Stock, - - -	8,586 81	
Water Works Coal, - - -	4,729 99	
Atlas of the City, - - -	840 00	
Water Works Service Cocks, - -	122 83	
Duncan Sherman & Co. - -	38,740 00	
	$1,887,244 19	$1,887,244 19

WATER FUND.

Statement of Cash Receipts and Expenditures by the Board of Public Works from the date of its organization, May 6, 1861 to Dec. 31, 1861, inclusive.

RECEIPTS.

Deposited by the Water Commissioners with City Treasurer, - -		$ 23,131 35
Water Tax collected, - - -	$111,560 50	
Received for shutting off and letting on water, &c., - - - -	78 94	
Received for tapping pipes, - -	1,265 50	
" " sale of materials - -	175 08	
" " " " boiler, - -	350 00	
" " thirty-eight Water Loan Bonds paid for new water pipe, -	38,430 15	151,860 17
		$174,991 52

EXPENDITURES.

Water Tax paid back by audited vouchers, - - - - -	$ 29 10	
Interest on Water Loan Bonds July 1st 1861, - - - - -	33,525 00	
Interest on same January 1st, 1862,	34,855 00	
Commission of Duncan Sherman & Co., for paying interest, - -	83 81	
Exchange paid on the above including the loss on the Water Coms'. deposit with Ch. M. & F. Ins. Co. and loss on Illinois and other currency, - - - - - -	11,473 65	
New Main and extension of distributing pipes, - - - -	53,723 76	
Operating expenses, - - -	24,823 87	
Tapping pipes expenses paid, - -	837 63	
Water pipes purchased and not used,	1,102 09	
Coal “ “ “ “	2,664 99	
Hydrants, “ “ “ “	201 24	
Atlas of the city, - - -	535 00	
	$163,855 14	
Add bal. in hands of City Treasurer,	11,136 38	
		$174,991·52

WATER FUND.

A detailed statement of the cost of the various operations conducted by the Board from May 6th to December 31st, 1861, inclusive. The statement shows first, the cash payments under the several accounts, and finally, the actual cost of all constructions, the repairs and operating expenses of the Water Works.

NEW MAIN ON PINE ST., WABASH AV., AND ADAMS ST.

	CASH PAYMENT.	TRUE COST.
874 tons and 634 lbs. 24 and 16 inch pipes, - - -	$33,214 95	
Carried forward, ...		33,214 95

Brought forward,	$33,214 95		
Sleeves, caps, branches and small castings,	359 08		
Dockage of pipe and rent of testing yard,	218 16		
Balance on wrought iron pipe at crossing of Chicago River and elsewhere,	1,284 18		
Testing and laying the pipes,	1,885 07		
Trenching and back filling,	1,119 03		
Balance for dredging or laying pipe across Chicago River and through the dock,	707 50		
Rent of dock used in laying river pipe,	179 17		
493 pigs of lead,	1,665 77		
Coal, $17.60, gasket packing, $47.28, plank $20.33,	85 21		
Tools and repairing tools $114.67, carpenter work $17,	131 67		
Stop-cocks,	1,366 40		
Hauling pipes,	364 70		
Work preparing testing press for use,	52 93		
Masonry for man-holes,	94 85		
Repairing wrought iron pipe $25, repairing paving $47.09,	72 09		
Miscellaneous and petty expenses	52 30	$42,853 06	
Add, for one 24 inch stop-cock, used, previously paid for,	187 50		$43,040 56

DISTRIBUTING PIPES.

Cast iron pipes, generally 4 and 6 inches, 189 167-2000 tons,	8,005 56		
Caps, sleeves and small castings,	72 50		
Testing and laying pipes,	700 81		
Trenching and back filling,	900 83		
Carried forward,	$9,679,70	$42,853,06	$43,040,56

Brought forward,		$9,679,70	$42,853,06	$43,040,56
23 Hydrants,		718 00		
Hydrant boxes,		90 09		
79 pigs of lead,		291 45		
Tools and repairs $12.32, miscellaneous, $1.90,		14 22		
Coal, $19, gaskets $5,		24 00	10,817 46	
Add, castings paid for by old iron,	$35 69			
72 pigs of lead previously paid for,	300 00			
One 4 inch hydrant,	45 00			
	$380 69			
Deduct, recd. for work at skating pond,	22 50			
Recd. for old iron sold,	90 72			
	$113 22	267 47		11,084 93
The only item charged to cost of Water Works, not included in the "Main" or Distributing Pipes, is, Engraving Bonds,			53 24	53 24
Total addition to cost of Water Works,			$53,723 76	$54,178 73

WORKING EXPENSES.

EXPENSES AT THE PUMPING WORKS.

Salary of Engineer and 2 assistants,	1,680 00
Firemen and laborers,	1,201 71
Coal, 1625 505-2000 tons,	5,990 27
Oil 173 galls, $139.15 tallow, 563 lbs. $52.49,	191 64
Cotton Waste,	100 26
Pack'g $24.50, grate bars $68.22	92 72
Hardware, $15.47, iron work,	
	$9,256,60

Brought forward, . .	$9,256 60		
$21.22, - . - -	36 69		
Gas $132, glazing $10.25, -	142 25		
Carpenter work $12.50, lumber $13.38, - - - - -	25 88		
Paints &c. $11.75, lightning conductor $9, - - -	20 75		
Miscellaneous and petty items, -	19 96		
Masonry repairs of fire room and engine house, - - -	44 08	9,546 21	9,546 21

REPAIRS AND MISCELLANEOUS OPERATING EXPENSES.

Repairing South Reservoir, iron work - - - - - -	1,521 68		
Labor cleaning, painting &c., for same, - - - - -	185 87		
Proof paint for seams for same,	31 25		
Masonry, repairing same, -	18 00		
Sewerage permit, same, - -	8 25		
Fencing S. Reservoir lot, -	121 24		
Glazing South, West, and North Reservoirs, - - -	9 00		
Labor of watching at Reservoirs,	82 00		
Wages of calkers, laborers, &c., repairing and taking care of pipes, hydrants, stop-cocks, &c.	1,255 36		
Repairs of hydrants, stop-cocks, and tools, shop work, - -	194 57		
Repairing and attaching meters,	134 57		
Hay and oats, $95.34, horse shoeing, $43.94, - -	139 28		
Wagon repairs $29.27, harness repairs $25.75, - - -	55 02		
Lumber chiefly for hydrant and stop-cock boxes, - -	44 96		
Nails and hardware $37.82, miscellaneous $51.32, - -	89 14		
Coal $6.10, lead $113.68, gaskets			
Carried forward, . . .	$3,890,19	$9,546,21	$9,546,21

Brought forward,	$3,890,19	$9,546,21	$9,546,21
$2.50	22 28		
Repairs of screen $9.50, grading engine house lot $10,	19 50		
Two 3 inch hydrants	63 00	3,994 97	
Deduct, receipts shutting off water and miscellaneous labor,	127 80		3,867 17

OFFICE EXPENSES AND SALARIES.

Salaries Water Comrs. and Secy. May 1st to 6th,	75 01		
Water Superintendent May and June,	300 00		
Commissioners Board of Public Works,	2,374 97		
Secretary $630, Engineer $1,200, City Superintendent $380.65, Clerks $1,796.69	4,007 34		
Water Assessor and Collectors,	2,633 88		
Half cost of new safe,	275 00		
Office furniture and fixtures,	166 00		
Rent of old Water Comr's. office,	600 00		
Labor, care of office &c.	114 00		
Blank books, stationery, binding and printing,	366 74		
Legal services,	116 66		
Advertising $116.85, newspapers $7.50,	124 35		
Coal $20.80, gas $1, horse feed, (assessor) $23.94	45 74		
Seal and press $10, miscellaneous $73,	83 00	11,282 69	11,282 69
Total operating expenses,		$24,823 87	$24,696 07

INTEREST.

Interest on Water Loan Bonds, July 1, 1861 and Jan. 1, 1862	68,380.00
Carried forward,	$68,380,00

Brought forward, - - -		$68,380 00		
Exchange paid on above, including the loss on Ch. M. & F. Ins. Co. Bank acct. with Water Commissioners, - -		8,682 01		
Commissions paid Duncan Sherman & Co., - - -		83 81		
Loss on Ill. currency taken in May, - - - -		2,713 58	79,859 40	
Add, amt. charged from discount to interest,	$2,490.18,			
Deduct, accrued interest on 38 bonds sold,	430.15	2,060 03		81,919 43

RECAPITULATION.

Total additions to Water Works	53,723 76	54,178 73
Total operating expenses, -	24,823 87	24,696 07
Total interest, - - -	79,859 40	81,919 43
	$158,407,03	$160,794,23

SERVICE COCKS.

Service of Tapper, - - -		$328 00	
Service cocks,		394 50	
Cast iron boxes and covers,		102 88	
Iron work repairing tapper's tools, &c., - - -		12 25	837 63
Add, service cocks previously paid for,	125.42		
Cast iron boxes and covers bo't with old iron,	49.56		
	$174.98		
	1,012 61		
Cash rects. for tapping, 1,265.50			
Service cocks on hand Jan. 1, 1862, 122.83			
Carried forward, . .			$159,244,66

Brought forward, - - -		$159,244 66
Profit on Service Cock acct.	375 72	
	$1388.33 $1388.33	

WATER PIPES.

Expended in purchase of pipes not used, - - - -	1,102 09

COAL.

Expended in the purchase of coal on hand, - - - -	2,664 99
Atlas of the City, - - -	535 00

STOCK.

6 hydrants purchased and not used . . . - -	$144.90	
Hydrant bends, . . .	56 34	201 24

INCOME.

Water rents paid back,	29 10	
Uncurrent money taken, . .	78 06	107 16
Total amount of payments by the Board May 6, to Dec. 31, 1861, - - - -		$163,855 14

WATER FUND.

Detailed statement of the expenditures by the Board of Water Commissioners from January 1st, 1861, to May 5th, 1861, inclusive:

NEW MAIN ON PINE ST., WABASH AV., AND ADAMS ST.

		CASH PAYMENTS.	ACTUAL COST.
24 inch wrought iron pipe crossing Chicago River, - -	$3,500 00		
Dredging, &c., laying river pipe,	2,200 00		
Use of dock for laying river pipe, - - - - - -	80 00		
Surveying $13.94, advertising $12.00, miscellaneous $1.50,	27 44		
Repairs of testing press $81.20			
Carried forward, ...	$5,807,44		

Brought forward, . . .	$5,807 44		
freight stop-cocks $4,14, -	85 34		
Expenses selling bonds, - -	27 15	$5,919 93	
Add, Commissions selling 19 Water loan bonds, - -	72 04		$5,991 97

DISTRIBUTING PIPE.

Laying pipes, - - - -	$32 00		
Trenching and back filling, -	82 93		
Making hydrant and stop-cock boxes, - - - -	37 00		
Rent of pipe yard $100, repairs tools, $4 75, - - -	104 75	256 68	
Add, pipe used previously paid for - - - $572.00			
3 hydrants, " " " 94.50	666 50		923 18
Total additions to Water Works,		$6,176 61	$6,915 15

EXPENSES AT THE PUMPING WORKS.

Services of Engineer and assts.,	$820 00		
" " Firemen and laborers,	613 68		
Coal, - - - - - -	18 91		
Oil 140½ galls., $128,08, Tallow 227 lbs., $23,84, - - -	151 92		
Packing $27,68, Gas $87, -	114 68		
Balance of payments for new chimneys, - - - -	66 88		
North smoke pipe, - - -	119 65		
Miscellaneous, - - -	115 37	2,021 09	
Add, Coal used previously paid for, - - - - -	2,911 62		4,932 71

REPAIRS AND MISCELLANEOUS OPERATING EXPENSES.

Labor—care of pipes, hydrants, stop-cocks, and flushing and repairs, &c., - - -	$1,458 55		
Watching reservoirs, - -	55 00		
Carried forward, . . .	$1,513,55	$2,021,09	$4,932,71

Brought forward, - - -		$1,513,55	$2,021,09	$4,932,71
Hydrant and stop-cock boxes and iron covers, - - -		96 19		
Repairs north res. tank $38.67, repairs hyd't and tools $73.75,		112 42		
Wagon repairs and horse exp'es,		81 33		
Publishing annual report, -		134 00		
Miscellaneous, - - -		45 22	1,982 71	
Add, water pipe previously paid for,	$32.90			
Deduct, miscellaneous receipts for labor, &c.,	$89.65	56 75		1,925 96

OFFICE EXPENSES AND SALARIES.

Commissioners, Secretary and Superintendent, - - -	$2,100 00		
Clerks $821.18, Collectors and Assessor, $941.12 - -	1,762 30		
Blank books and stationery, -	112 18		
Office rent $600, care office $65,	665 00		
Legal services, - - -	30 00		
Miscellaneous, - - -	70 54	$4,740 02	4,740 02

SERVICE COCKS.

Tappers' services $37, cast iron boxes $62,80, - - -		99 80		
Horse expenses $13 73, blacksmithing $18 10, - - -		31 83	131 63	
Add, service cocks used previously paid for	$61			
Cash rec'd for tapping,	84 23	23 23		108 40

Total operating expenses Jan. 1st May 5th,	$8,875 45	$11,707 09
" addit'ns to Wat'r W'rks Jan. 1st May 5th,	6,176 61	6,915 15
" interest (coms. for paying Jan. coupons),	91 84	91 84
	$15,143 90	$18,714 08

Brought forward, - - - - -	$15,143 90
Income—water tax paid back, - - -	40 05
Atlas of the City, - - - - - -	305 00
Quintard & Whitney, due them Jan. 1st, 1861 and since paid, - - - - -	485 49
	$15,974 44

SEWERAGE DEPARTMENT.

Trial Balance Ledger Board of Public Works, Dec. 31, 1861.

	Dr.	Cr.
Sewers North Division, - - -	$189,823 86	
Sewers South Division, - - -	249,347 29	
Sewers West Division, - - -	229,634 62	
Silvester Lind, Treasurer Sewerage Com.	107,746 53	
Sewerage Loan Bonds, 6 per cent., -		87,000 00
Sewerage Loan Bonds, 7 per cent., -		835,000 00
Sewerage Loan Bonds canceled, -		18,000 00
Sewerage Sinking Fund, - -		43,490 18
Sewerage Sinking Fund mortgages, -	26,467 10	
Discount on Sewerage Bonds, - -	30,220 26	
Sewerage Loan Interest, - -	21,545 97	
S. Myers, - - - - - -		157 50
House Drains, - - - - - -	12,506 05	
Sewerage Pipes, - - - -	12,374 21	
Sewerage Bricks, - - - -	73 87	
Sewerage Stock, - - - -	2,261 47	
American Exchange Bank, - -	31,957 50	
Dennis Coughlin, - - - -	1,561 51	
Patrick Smith, - - - -	1,347 75	
Samuel T. Foss, - - - -		1 75 00
William Smith & Co., - - -		1 25 00
Galena & Chicago Union Railroad Co.,		382 55
Sewerage Fund in the hands of City Treasurer, - - - - -		162 47
Sewerage Fund in Marine Bank, -	58,882 84	
Sewerage expense account office, -	6,807 28	
Cleansing sewers North Division, -	3,373 08	
Carried forward, - - -	$985,931 19	$984,492 70

Brought forward, - - - - -	$985,931 19	$984,492 70
Cleansing sewers South Division, -	6,369 21	
Cleansing sewers West Division, -	3,467 52	
Repairs of sewers North Division, -	950 51	
Repairs of sewers South Division, -	786 96	
Repairs of sewers West Division, -	1,214 29	
Cement account, - - - - -	35 63	
Sewerage Sinking Fund in hands of City Treasurer, - - - - -	1,135 05	
Chicago Gas Light & Coke Co., -	31 28	
Expenses in suit vs. S. Lind, et. al., -	22 00	
Z. Cobb, agent, - - - - -	31 53	
Henry Fuller, agent, - - -	29 44	
Sewerage bills payable, - - -		15 000 00
Lake Street Sewer, - - -		511 91
	$1,000,004 61	$1,000,004 61

SEWERAGE FUND.

Statement of Cash Receipts and Expenditures by the Board of Public Works, from the date of its organization, May 6, 1861, to Dec. 31, 1861, inclusive.

RECEIPTS.

Received at the office of the Board of Public Works, viz: house drain permits, - -	$867 20	
Materials sold and labor performed, - - - -	592 98	1,460 18
Add the following receipts by the Comptroller and City Treasurer, viz: Sewerage tax collected to Dec. 31, 1861, -	$12,853 29	
Received of S. Lind, Treasurer Sewerage Comr's, balance in hands of B. F. Carver & Co.,	50,142 35	
Received of S. Lind, Treasurer Sewerage Comr's, for check		

Sturges B. & Co., on B. F. Carver & Co., - - -	16,027 70		
Interest collected on collateral of E. I. Tinkham & Co., - -	150 00		
Balance in American Exchange Bank, N. Y., in excess of outstanding coupons of Sewerage Bonds, May 6, 1861,	840 98		
Borrowed of S. Sturgis & Sons,	15,000 00	95,014 32	96,474 50
Amount overdrawn with City Treasurer, - - - -			162 47
			$96,636 97

EXPENDITURES.

Sewerage interest July 1, 1861, and Jan. 1, 1862, including exchange and interest S. Sturges & Sons, -	$62,881 71	
Loss on balance account of Sewerage Commissioners, remaining in B. F. Carver & Co.'s bank, - - -	17,549 82	
Loss on check Sturges, Buckingham & Co. on B. F. Carver & Co., rec'd of S. Lind, Treasurer, - -	1,717 25	
Construction of Sewers excepting cement used, - - - - -	1,874 00	
Cleansing sewers, - - - -	1,715 60	
Repairing sewers, excepting cement used, - - - - - -	2,318 62	
Cement, $649,47; Shovels, $5,00, -	654 47	
Salaries, miscellaneous, office and legal expenses, - - . - -	6,883 08	
Work for private parties, - -	158 67	
H. L. Monroe, refunded money advanced by him to Sewerage Comr's,	50 00	
House drains, - - - -	833 75	$96,636 97

There has been credited S. Lind, Treas., the balance in the Marine Bank to the credit of the Sewerage Board, and this balance still remains there,		$58,882 84

SEWERAGE SINKING FUND.

Receipts by the Board of Public Works from May 6, 1861, to Dec 31, 1861, inclusive.

RECEIPTS.

Interest on Sinking Fund Mortgage, William Hildebrand, - - -	530 00	
Interest on Sinking Fund Mortgage, Hiram Joy, - - - -	605 05	$1,135 05
In hands of City Treasurer, - -		1,135 05

Cash Receipts and Payments by the Board of Sewerage Commissioners, from January 1st to May 5th, 1861, inclusive, as shown by their books.

RECEIPTS.

City of Chicago. Sewerage tax of 1859 and interest thereon, - -	6,051 56	
Sewerage tax of 1860, - - -	56,490 20	
American Exchange Bank, draft on them, - - - - -	28,000 00	
Exchange received on above draft and interest on deposit account, - -	2,465 44	
50 sewerage bonds sold April 4th,	50,000 00	
Timothy Wright, money loaned him Dec. 31, 1860, - - - -	3,000 00	
Matthew Conley, money loaned him February, 1861, - - - -	3,000 00	
House drain permits, - - -	345 75	
Pipes and oak sheeting sold, - -	54 00	$149,406 95
There was reported by Sewerage Board cash on hand January 1st, 1861, -		84,652 71
		$234,059 66

EXPENDITURES.

Construction account, - - -	2,500 58	
Cleansing sewers, - - - -	3,758 43	
Salaries, - - - - - -	4,316 64	
Office rent, - - - - -	351 34	
Office expenses, $83,70; Stationery, $95,97, - - - - -	179 67	
Coupon account, - - - -	3,158 40	
Repairs of Gas Company's pipes, -	200 29	
Pipes, dockage and storage, $50,00; Implements, $57,66, - - -	107 66	
Bills payable loan of June 1st, 1860,	30,000 00	
Interest on $30,000 loan, - -	1,326 43	
Matt. Conley, temporary loan to him,	3,000 00	
Discount on uncurrent bills, - -	50 40	
Thomas Iago, extra work allowed him,	50 40	
Robert Stewart, advanced by him for Green street sewer, - - -	150 00	
John Tyrell, advanced by him for Wabash avenue sewer, - -	25 00	
Ashley & Norris, advanced by them to pay coupons, - - - -	140 00	
	$49,315 24	
Cash balance as reported by Sewerage Board May 5th, 1861, not including American Exchange Bank balance,	$184,744 42	
		$234,059 66

SEWERAGE FUND.

Detailed statement of expenditures by the Board of Public Works from May 6th to December 31st, 1861, inclusive.

SEWERS—SOUTH DIVISION.

		CASH PAYMENTS.	ACTUAL COST.
Engineer, Draughtsman, Rodman	$176 67		
Labor, - - - - -	506 27		
Alteration of Gas Co.'s pipes, -	22 66		
Lumber $3,40, Nails .92, Advertising $1,18, - - -	5 50	$711 10	
Carried forward, - - -		$711 10	

Brought forward,		$711 10	
Cost of Lake street sewer, (excepting sewerage pipes used,) advanced by sundry individuals,	$511 91		
Sewerage pipes used in S. Div.,	1,064 95		
Materials used previously paid for	80 00		
Bricks used and not paid for,	12 07		
Cement account (cement used),	60 42		
Deduct receipts for materials	$1,729 35		
sold and work done,	42 34		
	$1,687 01		$2,398 11
SEWERS—WEST DIVISION.			
Engineer, Draughtsman, Rodman,	178 00		
Labor,	661 75		
Altering Gas Co.'s pipes,	13 26		
Lumber $3,41, Nails .91, advertising $1,19,	5 51		
Rubble stone $7,85, Miscel's $4,	11 85	$870 37	
Cost of Stewart avenue sewer, excepting pipe, (paid for by G. & C. U. R. R. Co.),	382 55		
Pipes used, $135; man hole and catch basin cover, $80,	215 00		
Bricks used not paid for,	102 38		
Cement used, (transferred from cement account,	60 41		
Deduct,	760 34		
Labor performed and materials sold, $11,25; pipes previously charged to sewers and now found to be on hand, $400,00,	411,25		
	$349 09		$1,219 46
SEWERS—NORTH DIVISION.			
Draughtsman $24, labor $258,67	282 67		
Altering Gas Co.'s pipes,	4 36		
Lumber $3,40, nails .92, advertising $1,18,	5 50	$292 53	
Carried forward,		$1,874 00	

Brought forward, - - -		$1,874 00	
Pipes used previously paid for,	60 00		
Man hole and catch basin covers,	40 00		
Cement used, (transferred from cement account,) - - -	6 75		
Deduct, - - - - -	$106 75		
Receipts for materials sold and work done, $33,13; pipes previously charged up and now on hand, $366,41, - -	399 54		
	$292 79		
Showing an actual credit to this account of, - - - -	.26		

SEWERAGE INTEREST ACCOUNT.

Sewerage coupons, July 1, '61 and Jan. 1, 62, - - -	62,270 00		
Exchange on above, - -	199 08		
Commissions paid Am. Ex. Bk. for paying above coupons and back coupons, - - -	225 14		
Interest on temporary loan, S. Sturges & Sons, - - -	187 49		
Loss on account of B. F. Carver & Co., - - - - -	17,549 82		
Loss on check paid over by S. Lind, Treasurer, - - -	1,717 25	82,148 78	82,148 78

CLEANSING SEWERS, SOUTH DIVISION.

Labor and superintendence, -	657 00		
Blacksmithing and miscell'ous,	15 87	672 87	672 87

CLEANSING SEWERS, WEST DIVISION.

Labor and superintendence, -	461 37		
Blacksmithing and miscell'ous,	15 38	476 75	476 75

CLEANSING SEWERS, NORTH DIVISION.

Labor and superintendence, -	551 13		
Blacksmithing and miscell'ous,	14 85	565 98	565 98
Carried forward, - - -		$85,738 38	

Brought forward, - - -			$85,738 38	

REPAIRS OF SEWERS, SOUTH DIVISION.

Labor and superintendence, -		546 78		
Lumber, nails and miscellaneous,		27 50	574 28	
Materials used transferred from other accounts, - -	$242 13			
Deduct receipts from sale of materials,	29 45	212 68		786 96

REPAIRS OF SEWERS, WEST DIVISION.

Labor and superintendence, - -		985 65		
Lumber and nails, -		15 98	1,001 63	
Materials used transferred from other accounts, - -	247 40			
Deduct rec'pts from sale of materials,	34 74	212 66		1,214 29

REPAIRS OF SEWERS, NORTH DIVISION.

Labor and superintendence, - -		729 65		
Lumber and nails,		13 06	742 71	
Materials used transferred from other accounts, - -	234 98			
Deduct receipts from sale of materials,	27 18	207 80		950 51

HOUSE DRAINS.

Services of Engineer,		800 00		
Horse keeping, -		33 75	833 75	
Pipe junctions used,	153 60			
Cash receipts and chg. for permits,	872 20	718 60		115 15
Carried forward, - - -			$88,890 75	

Brought forward, - - -		$88,890 75	

SEWERAGE EXPENSE ACCOUNT—OFFICE AND SALARIES.

Commissioners Board of Public Works, - - - - -	2,499 96		
Secretary $60, Engineer $1,200,	1,260 00		
Clerks $1,916.68, Assistant City Superintendent, $400, - -	2,316 68		
Office furniture and fixtures, -	119 58		
Legal services, - - -	366 67		
Blank books and stationery, -	189 84		
Miscellaneous, - - - - -	57 55	6,810 28	
Deduct am't paid by Z. Cobb for advertising, - - - -	3 00		6,807 28
Stock—			
Shovels purchased, - - -		5 00	5 00
Patrick Smith—			
Costs in suit vs. P. Smith and sureties, - - - -		50 80	50 80
H. L. Monroe—			
Refunded him his advance Sewerage Board for building a sewer, - - - - -		50 00	50 00
Expenses of suit vs. Lind et. al.,		22 00	22 00
Z. Cobb—			
Cash paid for sewer constructed for him, - - - -		17 44	
Add materials used transferred from other accounts, - -	14 09		31 53
H. Fuller—			
Cash paid for sewer constructed for him, - - - -		9 25	
Materials and permit, - -	20 19		29 44
J. B. Busch—			
Cash paid for sewer constructed for him, - - - -		4 81	
Add materials, - - -	6 84		
Deduct cash received from him,	11 65		
Carried forward, - - -		$95,860 33	

Brought forward, - - -		$95,860 33	
P. & Ft. W. R. R. Co.—			
Cash paid for alterations of sewers to suit rail road tracks, -		120 79	
Materials used, - - -	121 43		
Deduct cash received of P. & Ft. W. R. R. Co., - - -	242 22		
CHICAGO GAS-LIGHT & COKE CO.			
Labor making well cover, - -		6 38	
Materials used, - - -	24 90		31 28
Cement account—			
Cement purchased May 6–Dec.31		649 47	
Transferred to other accounts, used or sold, - - -	613 84		
Total cash payment, - -		$96,636 97	

Cash received by the Board of Public Works from May 6, 1861, to Dec. 31, 1861, inclusive, belonging to other than the Water and Sewerage Funds.

GENERAL FUND.

Permits for house moving, obstructing streets, &c., - -	$160 95

BOARD OF PUBLIC WORKS APPROPRIATION FUND.

Received for damage to bridges, sales of materials, &c., -	151 93

CEMETERY FUND.

Received for vacation of alley, - - - - -	10 00
	$322 88

CEMETERY FUND.

Statement of Expenditures by the Board of Public Works from May 6, 1861, to Dec. 31, 1861, inclusive.

EXPENDITURES.

Labor and teaming expended in improving grounds of cemetery, - - - -	2,445 87	
Salary of John C. Ure, Superintendent, -	266 65	
Trees and evergreens, - - - -	159 00	
Fountain, - - - - - -	71 03	
Lumber, - - - - - -	44 12	
Nails and hardware, - - - -	19 23	
		$3,005,90

BOARD OF PUBLIC WORKS APPROPRIATION FUND.

Statement of expenditures by the Board from May 6, 1861, to Dec. 31, 1861 inclusive, being cash payments.

EXPENDITURES.

South Division, streets and sidewalks chiefly,	$ 5,721 98	
West Division, streets and sidewalks chiefly,	7,579 51	
North Division, streets and sidewalks chiefly,	5,045 71	
Public Buildings, - - - - - -	1,445 41	
Bridge Department, - - - - -	10,881 75	
Lumber, (bal. not chg'd to S.W. and N. Div's)	907 45	
Expenses office, - - - - - -	825 20	
Harbor, - - - - - - - -	208 75	
Public Parks, - - - - - -	5 76	
Intersection of streets, - - - -	199 65	
		$32,821 17

CITY DEPARTMENT.

Trial Balance, Ledger Board of Public Works, Dec. 31, 1861.

	Dr.	Cr.
City appropriation fund in hands of City Treasurer, - - - - - -	$51,722 76	
North Division, - - - - -		$8,658 29
South Division, - - - - -		4,798 02
West Division, - - - - -		8,040 32
Public Buildings, - - - -		1,114 43
Lumber account, - - - -	464 32	
Bridge Department, - - - -		6,415 38
City expense account office, - -		724 80
Chicago Harbor, - - - -		291 25
Public Parks, - - - - -		494 24
City proportional expense account, -		6,850 00
Intersections of streets, - - -		14,800 35
Special assessments, - - - -	13,485 59	
Lake street improvement, - - -		13,261 20
South Water street improvement, -		214 39
Sidewalk improvements, - - -		10 00
New school houses, - - - -	10,005 75	
Wabash Avenue school house, - -		8,826 75
Scammon Branch school house, - -		1,179 00
	$75,678 42	$75,678 42

Detailed statement of Expenditures, under the appropriation by the city, for the Board of Public Works, showing the actual cost of each account.

Amount appropriated by the city, -	$76,800 00	
Street taxes collected to Jan. 1, '62, -	7,608 00	84,408 00

EXPENDITURES—SOUTH DIVISION.

Labor on streets and sidewalks, - -	3,654 63	
Services of clerks $164.48, Rodman $5.83,	170 31	
Printing street tax notices and receipts,	23 99	
Distributing street tax notices, - -	242 00	
Lumber, - - - - - -	542 99	
Nails and spikes, - - - -	127 75	
Stone, - - - - - -	449 99	
Repairs of paving $230.91, tools, $7,27,	238 18	
Paving intersection of Dearborn st. with alley between Lake and South Water,	110 50	
Re-paving gutters on Clark street, bet. Lake and South Water streets, -	85 20	
Altering catch basin cor. Lake and Wells streets, - - - - - -	23 37	
Building wall on Clark street, - -	40 00	
Hay $2.17, barricades for election $10.90,	13 07	
	$5,721 98	
Deduct am't paid by P. F. W. Peck for repairs of sidewalk $2, gravel sold .50,	2 50	5,719 4

WEST DIVISION.

Labor on streets and sidewalks, - -	$4,919 82	
Services of clerks $164.52, Rodman $4.59,	169 11	
Printing street tax notices and receipts,	23 50	
Distributing street tax notices, - -	300 00	
Lumber, - - - - - -	1,564 25	
Nails and spikes, - - - -	275 36	
Stone, - - - - - -	272 28	
Tools, - - - - - -	41 62	

Hay $2.67, barricades for election $10.90	13 57	
	$7,579 51	
Deduct am't paid by C. Stein for sidewalk built, $2.33; gravel sold, $0.50,	2 83	7,576 68

NORTH DIVISION.

Labor on streets and sidewalks,	3,555 46	
Nails and spikes,	140 00	
Tools,	14 06	
Lumber,	560 38	
Services of clerks $164.51, Rodman $5.83	170 34	
Printing street tax notices and receipts,	20 50	
Distributing street tax notices,	214 00	
Stone,	349 43	
Repairs of paving,	8 47	
Hay $2.17, barricades for election $10.90,	13 07	
	$5,045 71	
Deduct stone and gravel sold,	30 50	5,015 21

PUBLIC BUILDINGS.

COURT HOUSE.

Repairs plastering $5, repairs city treas. office $9.82,	14 82

CITY HOSPITAL.

Roofing engine house $26.14, plumbing $5.75,	31 89

WEST MARKET.

Repairing roof $28.50, plumbing $31.99,	$60 49

NORTH MARKET.

Plumbing,	10 44

CITY BRIDEWELL.

Repairing roof,	47 79

ARMORY.

Painting roof $91.12, tin and solder $2.05		93 17	

BELL TOWERS.

Labor $75.12, lumber $18.65,		93 77	

ENGINE HOUSES.

Whitewashing $19.50, carpenter work $328.70,	$348.20		
Laying drain La Salle st. Engine House,	21.63		
Lumber $150.43, plumb. $32.57,	183.00		
Plastering $31.00, glass and glazing, $46.50	77.50		
Nails, bolts, hinges and locks,	36.60		
Laying water pipe,	58.04		
Tin and zinc,	6.23	$731 20	

LARRABEE STREET ENGINE HOUSE.

Paid Wm. Arend on acct. for build'g,		402 00	$1,485 57

BRIDGE DEPARTMENT.

Carpenter work $77.87, chain $29.09, oil $146.75,	$253 71	
Piles $267.56, nails and spikes $95.52, oars $13.44,	376 52	
Hay and oats $26.67, hardware and tools $51.97,	78 64	
Jackscrews $31.50, lumber $346.96,	378 46	
Wells daily list of vessels in port,	14 50	$1,101 83

NORTH AVENUE BRIDGE.

Salary of bridge tender,	$168 55	
Carpenter work $20.74, iron work $3.08, stove-pipe $5.37, coal $4.20,	33 39	$201 94

CLYBOURNE AVENUE BRIDGE.

Carpenter work,		9 75

CHICAGO AVENUE BRIDGE.

Salary of tender,	350 00	
Carpenter work $18.50, coal $12.60, tools $3.75, lumber $4.25,	39 10	389 10

ERIE STREET BRIDGE.

Salary of tender,	350 00	
Carpenter work $9.01, coal $6.30, chain hooks $1.50,	16 81	366 81

INDIANA STREET BRIDGE.

Salary of tender,	350 00	
Carpenter work $12.37, coal $8.40, lumber .72, glass .50,	21 99	
Tools and iron work,	5 92	377 91

KINZIE STREET BRIDGE.

Salary of tender,	420 00	
Carpenter work $15.39, bell $9.60, stove bottom $1.05,	26 04	
Coal $8.40, bolts and straps .80,	9 20	455 24

RUSH STREET BRIDGE.

Salary of tender,	675 00	
Carpenter work $96.83, iron work $120.43, bell $9.60,	226 86	
Repairs masonry $10, stove and pipe $5.52, coal $8.40,	23 92	
Lumber,	4 79	
	$930 57	
Deduct, amount received from sundry vessels for damage by collisions	82 60	847 97

CLARK STREET BRIDGE.

Salary of Tender,	675 00	
Carpenter work, 46.23; iron work, 3.13; Coal, 8.40,	57 76	

Stove and pipe, 6.50; timber, 7.93; damage to schooner, 119.52,	133 95	866 71

WELLS STREET BRIDGE.

Salary of Tender,	675 00	
Carpenter work, 188.64; iron work, 163.93; bell, 9.60; coal, 8.40,	370 57	
Lumber, 45.41; painting, 38.69; cable and turnbuckles, 100,	184 10	1,229 67

LAKE STREET BRIDGE.

Salary of Tenders,	615 00	
Carpenter work, 40.98; lumber, 7.40; iron work, 11.65,	60 03	
Stove and pipe, 5.87; coal, 8.40,	14 27	
	689 30	
Deduct ams. recd. of schr. Commerce, for damage,	10 00	679 30

RANDOLPH STREET BRIDGE.

Salary of Tender,	615 00	
Carpenter work, 329.23; iron work and tools, 71.99; coal, 8.40,	409 62	
Lumber, 93.43; bell, 9.60; stove and pipe, 6.86; glass, 25 cts.,	110 14	
Plastering and building chimney,	12 00	1,146 76

MADISON STREET BRIDGE.

Salary of Tender,	600 00	
Carpenter work, 35.25; iron work, 51.35; glass, 37 cts.; coal, 8.40,	95 37	
Bell, hangings and freight,	16 82	
	712 19	
Deduct ams. recd. of vessel for damage,	2 00	710 19

The following is a description of the points from which water was taken for analysis by Messrs. Blaney and Mariner:

DATE.	NO. OF SPECIMEN.	WHENCE TAKEN.	REMARKS.
1861.			
April 17	No. 1	1,000 feet from Cleaverville..	Surface of Lake.
" "	" 2	One mile out from Cleaverville.....	" " "
" "	" 3	One mile out from Cleaverville.....	Bottom of Lake.
" "	" 4	One mile out from Engine House..	Surface of Lake.
" "	" 5	One mile out from Engine House..	" " "
" "	" 6	1,000feet out from Engine House	" " "
" "	" 7	Near the Light House................	" " "
" "	" 8	Near Clark street Bridge............	When the above specimens were taken the lake was somewhat agitated by wind, and there appeared to be a dark belt extending northwardly from the mouth of the river.

The following specimens were collected at the Engine House by Mr. Cregier:

DATE.	NO. OF SPECIMEN.	WHENCE TAKEN.	REMARKS.
1861.			
May 20	No. 9	Engine House........................	
June 3	" 10	Engine House...........	
Aug.	" 11	From "dead ends" north of pumping works......	
"	" 12	From "dead ends" north of pumping works..........................	
Sept. 20	" 13	300 feet from breakwater at Engine House..............................	Surface of Lake calm.
" "	" 14	1 mile from breakwater at Engine House	Bottom of Lake wind N E rough.
" "	" 15	1 mile from breakwater at Engine House	Surface of Lake wind N E rough.
" "	" 16	2 miles from breakwater at Engine House.....................	Surface of Lake wind N E very r'h
Oct. 18	" 17	Wallis' lower story tap, Lake near Clark street..........................	A peculiar rain water appearance
" "	" 18	Inlet in basin at pumping works...	
Oct. 22	" 19	From "dead end" on Milwaukee Av.	
Nov. 19	" 20	From South branch at Old st. Br.	
" "	" 21	From South branch at Van Buren street Bridge......................	
" "	" 22	From river at Clark st. Bridge.....	
" "	" 23	From North branch at Chicago Avenue Bridge......................	

The report of the Chief Engineer of the Board, E. S. Chesbrough, accompanying and submitted with this, treats quite fully of the state of the water, and the Council will find it of interest to refer to it in connection with our own remarks on the same subject.

INCOME AND EXPENSES OF THE WATER WORKS.

The income of the year from water rents, and including the small sum received as profits for tapping the pipes, has fallen a little below that of last year.

Income of 1861 from water rents and tapping pipes	$131,035 10
" " 1860 " " " " "	$131,536 34
Repairs and operating expenses 1861	$36,403 16
" " " 1860, including $2,557 61 for the cost of the new chimney and smoke pipes	$40,244 08
Interest 1861	$82,011 27
" 1860	$71,474 91

The increase of the cost of interest for the year 1861 is due mainly to the loss on the Chicago Marine & Fire Insurance Cos. account with the Water Commissioners, amounting to $8,095 97.

The whole income of the works from their commencement amounts to	$744,244 19
The interest and operating expenses for the same time amounts to	$689,110 61
Total excess of revenue	$55,133 58
The excess of the year 1861 was	$12,620 67

WATER ASSESSMENTS.

The method of enforcing the collection of assessed water tax on buildings within the water district, but not connected by service pipes with the street mains, is laborious and expensive both to the city and the parties assessed. We are of the opinion that the tax should be made as low as will be consistent with other water rates—lower than it generally is now—and that it should become a lien in all cases on the lots bearing the buildings assessed. We are also of the opinion that all property benefited by the introduction of the water pipes, should be taxed in proportion to the benefit received, and in this class we include all lots vacant or occupied fronting on the streets where the pipe is laid. We invite your attention to the remarks of Secretary on this subject.

METERS.

The Board are introducing Meters from time to time for the determination of the water rates of large consumers. It is our own experience as of Boston, New York, and other cities, that Meters afford the only just means of assessing parties using large quantities. Such parties have heretofore been assessed by an estimate of the amount used, and so long as there is no inducement for the consumer to limit his use of water to his real necessities, it is almost always found that the estimated amount is much too small. We have now some twelve Meters, and have ordered others with the intention of applying them to the large hotels, breweries, and manufacturing establishments.

The rates determined by Meters during the year 1861, amount to about four thousand dollars.

PURCHASE OF PIPES FOR FUTURE WANTS.

A contract has been made with Messrs. R. D. Wood & Co., of Philadelphia, for some 400 tons of 4, 6, and 8 inch pipes for furnishing with water such parts of the city as are in urgent need of it, and for filling up certain gaps for the improvement of the supply to pipes already laid.

SEWERAGE DEPARTMENT.

There are now laid in the city 54¼ miles of public sewers. The state of the Sewerage Funds has prevented any considerable extension of the Sewers during the year, but the works have been kept in good repair throughout, and are now everywhere serviceable and in general good order.

The few sewers that have been laid during the year, have generally been built by means advanced by individuals benefited by their construction.

The cleaning and repairs of the sewers for the year 1861 has cost $8,425,79. Considering the extent of the sewers, this amount is certainly not large, but it is the hope of the Board that it may be even less than this amount during the present year.

Besides the public sewers, of which we have already given the extent, there are in connection with them 2,437 private drains, constructed under the supervision of the Sewerage Board. Mr. W. H. Clarke, besides his other duties as Assistant Engineer of the Board, has the special charge of private drains.

The Board has now no resources for the construction of sewers. There is in the Marine Bank the balance to the credit of the late Sewerage Commissioners of $58,882,84, which the bank has refused to pay at par, and for which suit has been commenced.

The balance of account charged to S. Lind, Treasurer of the late Board, is $107,746,53. Suit has been commenced against the Sewerage Commissioners and their bondsmen to recover the balance due from them.

The report of the Chief Engineer of the Board will supply our own lack of details, and to this we beg to refer the Council for a more full account of all matters pertaining to the construction and working of the sewers during the year.

GENERAL CITY DEPARTMENT.

STREETS AND SIDEWALKS.

The limited means, within the control of this Board, entirely prevents any expenditure, beyond ordinary repairs, and the cleaning of streets and gutters. The new Charter provides that all improvements of streets, and the building and repairing of sidewalks, shall be made by special assessment, upon the abutting property, and this on petition of three-fourths of the property-holders—(except where some urgent necessity shall exist—when it may be done on the recommendation of the Board, and the concurring vote of three-fourths of the Common Council.) By the operation of this law we are prevented from making many necessary repairs, that are loudly called for by our citizens, until the necessary means can be raised, by general tax, or special assessment; and under the existing embarrassment, that has prevailed during the past year, we have felt disinclined to undertake new improvements, unless called upon to do so by an unmistakable majority of those persons who were to be called upon to foot the bills, and have petitioned therefor. Among the improvements which have been undertaken, and that seemed to require immediate attention, are Lake street, the east end of South Water street, Monroe street from Clark to State, and North Wells street from the bridge to Green Bay Road. The first named improvement has been completed from Lake street bridge to the east line of Wabash Avenue. The short space between Wabash Avenue and Central Avenue is under contract, and will be finished as soon as practicable. South Water street, from Dearborn street to River street, has also been brought to grade, and paved with stone block paving. The Mouroe street and North Wells street improvements will be put under contract as soon as the ground settles and is in a suitable condition.

All the leading thoroughfares from the country into the city are in very bad condition—particularly Milwaukee Avenue, Blue Island Avenue and Green Bay Road—and cannot be kept in passable condition with the small fund that arises from street taxes and the usual appropriation for street repairs. The old plank are almost entirely worn out, and in many places removed, leaving impassable holes during the muddy weather. These leading streets cannot be improved satisfactorily to the public, and in a manner to meet the increasing travel or business over the same, without making an assessment upon the abutting property. The owners of property thereon have hitherto refrained from petitioning for the required improvement, for the reason that they have felt unable to meet the assessment. But the time has arrived when patching will not answer the purpose, and permanent improvements of some kind (either of gravel or McAdam), should be made without further delay.

The opening of Dearborn street from Madison to Monroe street, and the removal of the old buildings thereon, was undertaken by the Board early in the season, and assessment made, and sale ordered of the buildings. The sale has been postponed by injunction on two several occasions. The Board now await the decision of the Court on the last writ, and when decided will again proceed in the work of opening the same, which is so urgently demanded by our citizens.

That the streets and sidewalks of the city may be under proper supervision, the Board has divided the different divisions of the city into suitable districts, and has appointed a foreman for each district. For the care of the sidewalks there is one foreman in each division. For the care of the streets there are generally two foremen in each division.

Besides the street taxes worked out, there has been expended on the streets and sidewalks since the organization of the Board and during 1861 the following sums:

South Division,	$5,719 48
West "	7,576 68
North "	5,015 21

PUBLIC BUILDINGS.

The Board has expended on the various public buildings of the city the sum of $1,485,57, most of which was spent on the engine houses.

BRIDGES.

There are sixteen bridges under the care of the Board, all of which are in good repair. No unusual outlay is anticipated in this department during the coming year.

HARBOR AND PUBLIC PARKS.

The sum appropriated by the Council for these objects was inconsiderable, and the expenditures on them have been limited to what was absolutely necessary to preserve them from injury.

CEMETERY.

The cemetery grounds have been greatly improved in appearance by the work of the past year, and we trust to the gratification of the citizens generally as of the Board.

In the cemetery proper the roads have been improved by grading, filling with clay, and covering with gravel, so as to make good carriage drives. Trees have been planted along the sides of the drives, and the sidewalks divided from the roadway by a strip of sodding. The fence around the cemetery grounds has been put in repair, and at the entrance to the cemetery a small fountain has been erected.

Perhaps as general an interest will be felt in the work done in that part of the grounds lying north of the cemetery proper, and which has not yet been subdivided into lots. Here are some 40 acres of public grounds of diversified surface, bordering on the lake, covered with a young growth of wood, and affording to the city the promise of an attractive park, at a small expense. Without any large expenditure here, a good deal has been accomplished in giving the grounds an inviting appearance, and by trimming up and thinning the young trees, to secure a good growth and shape to such as are left standing. A gate has been built in this part of the grounds, and several small bridges thrown across the county ditch flowing through the grounds and discharging into the lake. Continuous drives will be made through the cemetery and park, and the grounds made a pleasant place of resort for parties either walking or riding.

It is very desirable that these improvements should not be arrested here, and as the funds with which they have been made are nearly exhausted, that means be provided for their further progress.

The charge of the cemetery grounds, as of the public parks of the city, have been in the hands of Mr. John C. Ure.

The total expenditure by the Board at the cemetery amount to $3,005,90.

The details of all expenditures by the Board are presented in their accounts accompanying the report of the Secretary.

All of which is respectfully submitted,

BENJ. CARPENTER, FRED. LETZ, J. G. GINDELE.	Board of Public Works.

REPORT OF THE CHIEF ENGINEER.

Chicago, Feb. 24th, 1862.

To the Board of Public Works:

Gentlemen: Your Engineer would respectfully present this, his first annual report:—

When first appointed, he had charge only of the construction and maintenance of the sewers, his other duties being simply those of consulting engineer. Since then you have placed the construction and repairs of the Water Works under his charge.

As the Water Department is older than that of Sewerage, it will be natural to speak first of the

WATER WORKS.

No report on them having been made since that of Jan. 1, 1861, by the officer then in charge of them, Superintendent Walker, it will be necessary to include in this statement what was done under the direction of Mr. Walker, between the first of January and the time of the new organization of this department.

CONDITION OF THE WORKS.

The water works are believed to be in as good a condition as ever before, saving the exceptions below mentioned and the natural wear and tear inseparable from their use, and the inevitable decay which the materials they are composed of must suffer.

Although several accidents have occurred during the year, fortunately it has not been necessary in repairing any one of them to deprive the whole city of water a single minute, although large districts have been cut off for several hours. Whenever it has been practicable, these repairs have been made at such an hour of the day, and sometimes of the night, as to cause the least inconvenience to large hotels, manufacturing establishments using steam engines, &c.

PUMPING WORKS.

These are in excellent condition and have required no unusual repairs during the year. The report of the Engineer in charge of them gives a full and satisfactory statement of their condition and performances during the year 1861.

REPORT OF THE ENGINEER OF THE PUMPING WORKS.

Engine House C. W. W.,
January 1st, 1862.

E. S. Chesbrough, Esq.:

Sir: The usual Annual Statement of matters connected with the Pumping Works, for the year ending December 31st, 1861, is herewith respectfully submitted.

It will be seen the quantity of water distributed the past year is but a trifle more than was pumped in 1860.

The amount pumped in 1859 over 1858 was equal to 29½ per cent., and the quantity pumped in 1860 over 1859 equaled 21¼ per cent.; while 1861 exceeded 1860 only about 3 per cent.

The trifling increase of the past year over 1860 may be accounted for to some extent by the fact that in 1860 it was necessary to waste a considerable amount of water at the Engine House, while through the past year the waste in the same quarter has been comparatively small, and since the completion of the new main, the necessity for wasting has been entirely obviated.

Causes other than those alluded to perhaps exist for the slight difference which appears in the amount pumped in 1861 over 1860, but they exist entirely outside of the pumping works.

The following table will show the quantity of water pumped each month of the last four years:

MONTHS.	1858.	1859.	1860.	1861.
January,...............	81,538,179	106,905,665	132,284,454	137,651,918
February, ...	69,426,515	106,401,412	130,800,720	142,071,067
March,............ ...	82,677,463	102,415,983	150,331,680	135,576,447
April,..................	82,600,782	89,994,235	132,930,546	128,371,178
May, ...	82,279,920	116,107,263	141.171,078	150,489,168
June, ...	90,211,505	113,098,416	148,197,024	155,996,352
July, ...	101,670,736	133,800,336	166,394,640	147,182,793
August,................	107,176,652	123,266,556	152,427,690	168,602,494
September,...........	108,534,540	131,735,847	132,272,202	152,710,186
October,................	101,046,605	141,527,040	148,710,195	149,362,166
November,............	86,385,840	127,342,018	150,493,248	153,879,648
December,............	98,316,722	122,653,139	130,773,075	145,261,272
Totals,.........	1,091,865,457	1,415,147,910	1,716,786,552	1,767,154,689

It will be seen that 1,767,154,689 gallons have been pumped the past year. Of this amount

The large engine pumped	1,072,485,120	galls.
The small " "	694,669,569	"

The engines have been in operation the past year 5,967 hours and 44 minutes, which is an average of 16 21-60 hours of each day throughout the year.

The amount of coal consumed the past year is 2,431 653-2000 tons, which is about 190 tons less than was consumed in 1860. This decrease may be attributed in part to the superior condition of the small engine, resulting from the new steam piston which was attached in the latter part of 1860, also to the benefits derived from the enlarged "main," and perhaps the character of the coal, which as a general thing was of better quality than that received in 1860.

Of the foregoing amount of coal 116 1165-2000 tons is due to the necessity of stopping the engines at different times through the day when the reservoirs are full, it being consumed for the purpose of keeping up steam when the engines are at rest. These stops have occurred 607 times the past year, consuming nearly 400 lbs. of coal each time.

The limited capacity of the reservoirs makes it necessary to keep fire in the boilers continually, the fires not having been out in nearly eight years.

The following tables will show in detail the operations of the engines and boilers for the past year.

Large Engine.

Months.	No. of days run.	No. of hours and min. run per month.		Av. No. h's and min. run p day		Average No. of gallons pumped per day.	Whole number of gallons pumped per month.	Pounds of Coal used for pumping.	Pounds of Coal used for keeping steam.	Total pounds of Coal consumed.	Number of revolutions made.
		H	M	H	M						
January..............	7	109	39	15	40	4,903.810	34,326,672	102,800	5,800	108,600	42,067
February............	26	415	38	15	59	5,187,752	134,881,536	387,300	19,900	407,200	165,296
April..................	16	211	52	13	14	4,455,411	71,286,576	189,000	12 000	201,000	87,361
May....................	31	436	04	14	04	4,854,489	150,489.168	350,400	24.800	375,200	184.423
June	30	465	30	15	31	5,199,878	155,996,352	400,050	22,500	422,550	191,172
July....................	3	43		14	20	5,037,984	15,113,952	36,600	1,975	38,575	18,522
August...............	21	342	13	16	18	5,492,303	115,338,336	283,935	12.925	296,860	141,346
September...........	24	379	37	15	49	5,145,798	123.499,152	338,210	14,525	352,735	151,347
October...............	10	149	25	14	57	5,374,992	53,749,920	134,110	7,470	141,580	65,870
November...........	30	421	46	14	03	5,129,321	153.879,648	385,090	23,700	408,790	188,578
December............	13	168	52	12	59	4,917,216	63.923.808	164,933	12,120	177,053	78,338
Totals	211	3,143	36				1,072,485,120	2,772,428	157,715	2,930,143	1,314.320

Small Engine.

Months.	No. of days run.	No. of hours and min. run per month.		Av. No h's and min. run p d'y		Average numb'r gallons pumped per day.	Whole number of gallons pumped per month.	Pounds of Coal used for pumping.	Pounds of Coal used for keeping steam.	Total pounds of Coal consumed.	Number of revolutions made.
		H	M	H	M						
January....................	24	432	43	18	02	4,305,219	103,325.246	275,800	13,050	288,850	199.162
February..................	2	29	20	14	40	3,594,765	7,189,531	20,600	1,300	21.900	13.858
March......................	31	561	22	18	07	4,373,434	135,576,447	380.700	15,500	396,200	261,327
April.........................	14	236	20	16	53	4,077,472	57,084.602	158,700	7,200	165.900	110,032
July...........................	28	530	44	18	57	4,716,744	132,068.841	346,650	12,850	359.500	254.566
August......................	10	213	29	21	21	5,326,416	53,264,158	137,540	3,100	140.640	102,668
September................	6	120	21	20	03	4,868,506	29.211,034	75.540	2.350	77,890	56,305
October	21	390	06	18	35	4,552,964	95,612,246	241,890	8,400	250,290	184.295
December..................	18	309	43	17	12	4,518,748	81,337.464	219,640	11,700	231.340	156,780
Totals....................	154	2824	08				694,669.569	1,857,060	75,450	1,932.510	1.338,993

Recapitulation.

Engines.	Number of days	No. of hours.		Galls Pumped.	Pounds of Coal consumed for pump.ng	Pounds of Coal consumed for steam.	Total pounds of Coal consumed.	Number of revolutions.
		H	M					
Large	211	3,143	36	1,072,485,120	2,772,428	157,715	2,930,143	1,314,320
Small	154	2,824	08	694,669,569	1,857,060	75,450	1,932,510	1,338,993
Totals	365	5 967	44	1,707,154,689	4 529,488	233 165	4,862,653	2,653,313

The greatest amount pumped in one day by the large Engine was on August 17th, 6,072,672 gallons, running 17 hours and 10 minutes. The least quantity pumped in one day was on January 25th, 3,769,920 running 12 hours and 5 minutes.

The largest amount pumped in one day by the small Engine was on August 3d, 5,427,686 gallons, running 21 hours and 40 minutes. The smallest amount pumped in one day was April 14th, 3,531,141 gallons, running 15 hours and 25 minutes. This Engine was in operation without stopping 46 hours and 51 minutes, on the occasion of an accident to a large stop valve on the main pipe.

The daily average amount pumped for the year is 4,841,520 gallons.

I am enabled to reiterate the statement made one year ago in regard to the general condition of the engines, boilers, &c.

Throughout the past year they have proved *loyal*, no breakage of any kind having occurred, and up to this time they are in fair working order.

No repairs have been done the past year either upon the engines or boilers, beyond the usual attention demanded by all machinery of a like class, which of course has been performed by the regular employes. Perhaps the extent of repairs can be best judged by the amount expended therefor, a knowledge of which I am not in possession of, but I presume from the character thereof that the expenditure will be found trivial. In view then of the slight repairs which have been heretofore bestowed upon the present engines, it may not be out of place here to enquire briefly if justice can be done them in the future in regard to repairs, without a risk to the supply of water; for it must be borne in mind that the past should not be a criterion for the future, from the fact that all machinery, however well constructed, will in time require repairs of a general character, especially engines which have been in operation as much of the time as ours; and it must be remembered also that the extension of the works in other departments demands from the engines a corresponding increase of duty.

One of the engines has been in operation about eight years; the other five years. Through these periods it has been the design to keep them up to the standard of "good order;" to continue this standard it will soon be necessary to give attention to certain parts which can not be reached under ordinary circumstances, and it may also become necessary to detach important parts of the engines and remove them a distance from the works, in order to bestow proper repairs. This of course would require a considerable time, in which case we must depend upon one engine. A contingency has never yet occurred by which either of the engines has been disabled, and it is perhaps unnecessary to anticipate one; still in view of what has been stated, and with the knowledge that the reservoirs when full will contain (with extra economy), only about six hours supply, it may be said that we are not as well fortified against a failure in the supply of water as precedent would seem to show. A third engine, or even an increased reservoir capacity, would be likely to place us beyond the probability of a failure. To do justice to an extension of this character would perhaps consume eighteen months or two years.

On the 22d of June a portion of the well wall was removed for the purpose of connecting the new 24-inch main to the large engine, involving a small expense for the alteration of feed pipes, &c. Water was let into this pipe for the first time on the 3d of October. Most of the time since then it has been in use.

Water has been furnished to the "Ogden Skating Park" 14 hours through a 4-inch hydrant, and to the "Union Skating Park" 9 hours through a 2½-inch hydrant.

I would respectfully call attention to the general condition of the main building of the pumping works, which needs some repairs, especially the north wall, which is badly cracked in the vicinity of the steam pipe.

The list of tools remains about the same as last year, with the exception of small stores, which will be found appended.

There has been no change in the force employed on this part of the works the past year, most of whom have been connected with this department for several years.

Respectfully,

D. C. CREGIER, *Engineer.*

The remarks of both Mr. Walker and Mr. Cregier in their last annual reports, as well as those of Mr. Cregier in his present one, relative to the effect of the constant increase of consumption upon the small engine, by requiring a higher speed, and thus increasing the probability of accidents to it, are worthy of serious consideration. When the ordinary speed of an engine is increased beyond a certain rate, the probability of breakage increases much more rapidly than the rate of speed. This will become apparent when it is remembered that at a very slow rate the risk of breakage is practically nothing, while at a very high rate, breakage sooner or later must take place.

The continued depression of the manufacturing interests of the city, together with the small number of new buildings erected during the year, has caused a much smaller increase of consumption than would have taken place under more prosperous circumstances, and thus the danger to be apprehended from being obliged to run the small engine at a higher speed, is not so great as it was feared a few years ago it might now be. The laying of the new main, too, has diminished the head against which the engines have to pump. Although this cannot diminish the rate of speed at which the engines must work, it does diminish the strain upon them and consequently their liability to break. Had the rate of consumption increased as much in 1861 as it did in 1860, the small engine could not have supplied the city without working, at times, not only 24 hours in the day, but at a higher speed than is now considered judicious.

AVERAGE DAILY CONSUMPTION.

1858,	2,991,412	gallons.	7½ galls. to a cubic foot.
1859,	3,877,910	"	
1860,	4,703,525	"	
1861,	4,841,520	"	

ENGINE HOUSE AND GROUNDS.

No expensive or important improvements or repairs have been made to these, except in connection with the new main, which will be described under its appropriate head. The cracks in the north wall of the engine house look more and more serious, and should receive attention the coming season.

INLET.

This is not in very good order, and in consequence it has been very difficult to make the screens effective in keeping out fish or chips, that have been quite annoying in their action upon the pump-valves. The inlet will need a thorough overhauling next season, and it may then be found advisable to construct a new one.

BASIN IN THE LAKE.

This is gradually filling up with sand; and the breakwater around it shows more and more signs of decay.

Much annoyance has been experienced during severe storms, by the washing of hops and other refuse from the brewery south of the pumping works into the Basin. It is exceedingly desirable that whatever rights the owners of the brewery in question may have to deposit or retain offensive substances in such close proximity to the pumping works, should in some way be extinguished.

MAIN AND DISTRIBUTING PIPES.

The *new main*, for the laying of which arrangements were made last year, has been satisfactorily completed. It consists of a 24 inch pipe, starting from the south side of the base of the air chamber of the large engine, thence by a wrought iron curved pipe westward about 12 feet to a stop-cock, thence by a cast iron pipe under the south main entrance from the Pine street front of the engine room, directly west to near the east line of Pine street, where a 24 inch branch connects the new main with the old one. On this connecting branch is a 24 inch stop-cock. From this branch, the new main curves southward, and runs along Pine street a little west of the center of the street, to the south side of North Water street, where there is another 24 inch stop-cock. At this point the pipe is about 9 feet below the surface, and here begins a wrought iron 24 inch pipe, which continues to the south side of the river, and passes sufficiently far below its bottom to allow of its being covered with clay enough to protect it from anchors. The maker of this was Mr. C. Reissig, and it was put in its place by Mr. Martin Green, under the direction of Mr. Walker. It was feared at first that it might have been injured in the sinking, but a subsequent examination by means of man holes at each end, showed that if it leaked at all, it was too little to be of any importance. On the south side of Pine street there is an 8 inch blow-off, and just beyond the blow-off another 24 inch stop-cock. Between the dock walk on the south side of the River and the stop-cock, the pipe turns nearly a right angle to the westward. Here the cast iron pipe begins again, and continues along River street to Wa-

VAN BUREN STREET BRIDGE.

Salary of Tender, . . .	600 00	
Carpenter work, 57.74; bell, 9.60; iron work, 10.38, . . .	77 72	
Coal, 10.50; lumber, 10.23, . .	20 73	698 45

POLK STREET BRIDGE.

Salary of Tender, . . .	420 00	
Carpenter work, 44.51; iron work and tools, 24.43; oakum, 4.00, . .	72 94	
Lumber, 9.58; dredging, 80.00; coal, 8.40, . . .	97 98	590 92

TWELFTH STREET BRIDGE.

Salary of Tender, . . .	385 00	
Carpenter work, 142.38; iron work and tools, 34.70; lumber, 45.40, .	222 48	
Dredging, 67.00; coal, 8.40, . .	75 40	
	682 88	
Deduct amount received of Barque Republic for damages, . .	5 50	677 38

OLD STREET BRIDGE.

Salary of Tender, . . .	350 00	
Carpenter work, 26.88; iron work and tools, 6.79; coal, 8.40, . .	42 07	
Lumber, ...	2 95	395 02

HALSTED STREET BRIDGE.

Salary of Tender, . . .	183 33	
Carpenter work, 15.75; tools, etc., 2.75; stove and pipe, 4.27, . .	22 77	
Completing approach, 300.00; coal, 4.20,	304 20	510 30

LUMBER ACCOUNT.

Oak lumber purchased to Dec. 31st, .	2,644 42	
Used and charged to various accounts,	2,180 10	464 32

OFFICE EXPENSES.

One-third bill of seal and press,	10 00	
Stationery and advertising,	176 84	
Office furniture,	98 33	
Printing,	119 96	
Moving safe, 10.; half bill safe, 275.,	285 00	
Postage and petty expenses,	10 36	
Legal expenses,	116 67	
Daily newspapers,	8 04	825 20

HARBOR.

Removing obstructions,	118 37	
Repairs of life boats and docks,	87 38	
Lead lines,	3 00	208 75

PUBLIC PARKS.

Repairs of fountains and drinking cups,	5 76

INTERSECTIONS OF STREETS.

Constructing aprons on Lake and South Water streets,	199 65
	$32,755 87

SPECIAL ASSESSMENTS.

LAKE STREET IMPROVEMENT.

Amount of assessment roll for paving Lake st. with Nicholson pavement from Wabash av. to the bridge,	$28,282 33		
Amount of assessment roll for paving Lake st. with Nicholson pavement from Wabash av. to Central av.,	5,341 62	$33,623 95	
Estimates paid De Golyer, McClelland & Co,	20,170 00		
Amount paid for inspecting the work,	192 75	$20,362 75	
Balance unexpended Jan. 1, '62,			$13,261 02

Amount of contract with De Golyer, McClelland & Co. for paving from Wabash av. to bridge,	$22,600 00			
Less allowed by him for old boulders,	$1,200 00	$21,400 00		
Add, for area walls constructed and extras,		1,125 07		
		$22,525 07		
Estimates paid De Golyer, McClelland & Co.,		20,170 00		
Amount yet to be paid De Golyer McClelland & Co.,		$2,355 07		
Abatement to be made for excess of assessment over cost of work,		$5,362 53		
		$7,717 60		
Deduct, area wall constructed, not assessed,		27 55		
		$7,690 05		
Estimated balance for expenses making assessments &c.,		229 53	$7,919 58	
Amount of assessment for paving from Wabash av. to Central av., work not yet commenced,			$5,341 62	
				$13,261 20

SPECIAL ASSESSMENTS.

SOUTH WATER STREET IMPROVEMENT.

Amount of assessment rolls for paving So. Water st. from Dearborn st. to River st.,		$8,849 31
Paid A. McBean, contractor, for paving above,	$7,005 00	

Amount of abatement for area walls constructed by owners, . .	339 27	
Amount of abatement for excess of assessment over cost of work, .	1,290 65	$8,634 92
Balance for expenses making assesssments, &c.,		$214 39

SIDEWALK IMPROVEMENTS.

Amount of assessment roll for costructing sidewalk opposite lots 16 and 17 in Block 9 in Fort Dearborn addition to Chicago, ...		$162 23
Paid Alvin Salisbury, contractor, for building same, . . .	$130 00	
Amount of abatement for excess of assessment over cost of work, . .	22 23	$152 23
Balance reserved for expenses making assessment, &c ,		$10 00

NEW SCHOOL HOUSES—WABASH AVENUE SCHOOL HOUSE.

Amount of contract with W. H. Carter for masonry, . . .	$7,850 00	
Amount of contract with E. Walker for cut stone work, . . .	1,239 00	
Amount of contract with T. Maenard for carpenter work, . .	5,250 00	
Amount of contract with M.Greenebaum for roofing, . . .	1,360 00	
Amount of contract with M. B. Vanderkooi, for painting &c., . .	909 00	$16,608 00
Estimates allowed W. H. Carter on contract, ...	$5,781 25	
Estimates allowed T. Macnard on contract, ...	850 00	
Estimates allowed E. Walker on contract, ...	850 00	
	$7,481 25	

Amount allowed G. P. Randall architect on acct. of plans and superinten'ce,	300 00	$7,781 25
		$8,826 75

SCAMMON BRANCH SCHOOL HOUSE.

Amount of contract with T. Maenard for carpenter work, . . .	$1,975 00	
Amount of contract with W. Barker for masonry, ...	365 00	
Amount of contract with H. Schlau for painting, &c., . . .	260 00	$2,600 00
Estimates allowed T. Maenard on contract, ...	$1,200 00	
Estimates allowed W. Barker on contract, ...	181 00	
Estimates allowed H. Schlau on con'ct,	40 00	$1,421 00
		$1,179 00

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